GROWTH OF THE MEDICAL RESEARCH LITERATURE ON NON-WESTERN MEDICINE AS INDEXED BY THE NATIONAL LIBRARY OF MEDICINE FROM 1966-1993: AN EXAMPLE OF A SCIENTIFIC PARADIGM CHANGE

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ABSTRACT OF THE DISSERTATION

Growth of the Medical Research Literature on

Non-Western Medicine as Indexed by

The National Library of Medicine from 1966-1993:

An Example of a Scientific Paradigm Change

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The main purpose of this study is first to document and explain the process of scientific paradigm change and cross-cultural scientific communication using the growth and origins of the literature on non-Western medicine from 1966 to 1993 and second to test a series of theoretical assumptions about paradigm change. Bibliometric analysis of growth of the literature and content analysis of televised interviews, content analysis of published interviews, and journalists' reports on non-Western and alternative medicine were used to support a series of theoretical assumptions taken from the literature on scientific paradigm change and the sociology of science. Content analysis of medical research articles coded by MEDLINE as having specific MESH headings on philosophy and medical models coupled with analysis of all the clinical trials as well as selected journal articles published in referred serials yielded confirmation that a paradigm change in biomedicine is in progress. 15,561 references were downloaded in MEDLARS format from the CD-Plus version of Medline recoded and graphed. Findings indicate a 1,582 percent increase in the number of articles on

non-Western medicine from 1966 to 1992. It was found that because biomedicine lacks an underlying theory of how the body works one sees a crumbling of the biomedical model itself as anomalies such as acupuncture treatment cannot be explained. The main catalyst for change is initially triggered by external factors not internal ones and it is possible to identify specific events mentioned in the literature. Cross-cultural exchanges and fact gathering missions are published serving to motivate more and more researchers to investigate new models and question the prevailing paradigm. Debate occurs along a continuum. Shifts occur when the new paradigm is found to solve more problems than the old. Allegiances are formed almost immediately and rival camps are often adversaries who resent the attention the other group receives. Change takes place over decades. Skeptics do not accept results until they are verified outside of the field in question. Proponents are influenced by political propaganda and economic factors. Language, culture and one's own personal experiences all serve as barriers to scientific communciation.

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Table of Contents

List of Tables

List of Illustrations

SECTION I: INTRODUCTION

Problem Statement

The main purpose of this study is first to document and explain the process of scientific paradigm change using the growth and origins of the literature on non-Western medicine and non-Western pharmacology from 1966 to 1993. The purpose is to test a series of theoretical assumptions about paradigm change in order to claim that a shift toward the integration of non-Western medicine into conventional medicine has begun.

Rationale

Health care reform in the United States is a major issue that dominated media attention as it became a matter of national debate. Embedded within the issue as a whole is the problem of addressing concerns over the quality of conventional modern medical treatment and the validity of claims made that Western medicine is the only valid medical paradigm. Evidence exists that there is a growing sense of dissatisfaction within the medical community itself and within the public at large with the dominance of Western medicine. In some instances there have been forums at which groups have demanded access to a wider spectrum of medical treatments including access to non-Western medicine. General interest articles written to inform the public about non-Western medicine, articles in the business press about research into non-Western medicine, television programs and documentaries as well as academic articles provide documentation that can be used as the rationale for making the claim that American interest in non-Western medicine is growing.

The underlying assumption of this study is that each of these public signs of general, scientific and commercial interest in alternative medicine is an indicator that

conventional medicine is being forced to broaden its perspectives and possibly shift away from a Western dominated scientific paradigm on how pharmaceuticals are to be produced and disseminated and how medical treatment is to be administered. Specific examples of this public interest in alternative medicine will be provided which will support the claim that there has been a growing sense of dissatisfaction with the system of medicine that the American medical establishment has presented as the only system since the mid-nineteenth century.

It is the field of non-Western medicine and non-Western pharmacology that will, however, be the focus of this study, not alterative medicine as a whole. It is hoped that the methodology presented will serve as a basis for research into other aspects of alternative medicine; however, what is of interest here is the international transfer of scientific information across cultural and linguistic barriers and across time as well. Many of the articles within this data set discuss the medical findings published in ancient texts. In the effort to research both modern and ancient non-Western practices some scholars have also decided to search for forgotten cures as well (e.g. Holland 1994).

This study, therefore, will attempt to present evidence for a series of paradigm shifts that have occurred in respect to the scientific and medical knowledge of the past and of the present. Evidence of these shifts should be apparent in changes in the medical research literature. It is assumed that one indicator of a paradigm shift is the appearance in Western refereed journals of clinical trials, journal articles and review articles by authors who are either using or testing a paradigm that has been excluded from mainstream biomedical research since the last paradigm shift in the nineteenth century when "modern", "scientific" medicine gained dominance. Analysis of these

writings as well as material extracted from media reports are predicted to yield statements that follow the patterns indicating the various stages of paradigm change as outlined by Kuhn, Lakatos, Price, Merton, Laudan, Donovan, and others. The purpose of this study, therefore, is to assess how well the model of paradigm shifts fits the bibliometric data on non-Western medicine as a whole and non-Western pharmacology as a subset. At the same time, analysis of the data is expected to identify the external and internal factors surrounding changes taking place in the Western medical paradigm and demonstrate that mainstream refereed journals have actually published research in this area. In addition, it is hoped that this study will be both timely and an aid to the advance of research into the field of cross-cultural medical research.

Value of Proposed Study

This study is designed to make three major contributions to information science, the sociology of science and the history of medicine. The first is the simple bibliometric count of the number of articles per topic, per language and per country of publication. No such number count exists and without such a count, no analysis of the growth of the literature can be made. Several counts of subsets of the data set will also be produced which can be used as a basis for future research. The second contribution will be the documentation of a paradigm shift within Western conventional medicine and its counterpart -- Western based pharmacology. The third contribution will be the presentation of results from testing the theory that during a change in guiding assumptions on what areas of medical research are considered to be worthy of clinical studies, scientists associated with rival guiding assumptions and rival cultures fail to communicate until one group demonstrates the success of its treatments.

Bibliometric analysis of growth of the literature and content analysis of televised interviews from documentaries and television programs along with content analysis of published interviews and journalists' reports on non-Western and alternative medicine will be used to support a series of theoretical assumptions. Content analysis of a minimum of 100 medical research articles coded by MEDLINE as having specific MESH headings on philosophy, medical models and/or are clinical trials and journal articles published in refereed serials are predicted to yield confirmation that a paradigm change is in the process of occurring.

SECTION II: MEDIA ATTENTION

> "Early in the twentieth century, thinkers from several disciplines spawned a new area of inquiry now known as the sociology of knowledge. This relatively new discipline might be characterized as the study of the evolution and propagation of ideas and ideologies" - Schwartz and Ogilvy, 1979.

Introduction

Not since the scientific debate and subsequent public furor over evolution has there been an example of a scientific paradigm that has received such extensive media and public attention as there has been in the case of alternative medicine as a whole. Like the debate over evolution, the questions raised over health care issues, inside and outside of the medical community, are socially, politically, economically and philosophically charged. The debate over access to non-Western therapies is not just a simple consumer protection issue but one that involves various heritages and traditions. On the surface one only sees a quest for therapies and treatments to ease pain and suffering but underneath is a highly emotionally charged confrontation between diametrically opposed philosophical and religious belief systems. Although not often articulated, these issues are being discussed as one sees an ever growing level of public dissatisfaction with the current health care system.

Public Dissatisfaction

Bill Moyer's "Healing and the Mind"

Health care reform in the United States became an issue during the 1992 presidential campaign that continued to dominate the attention of the White House and the nation throughout 1993. Several meetings were held and a committee was formed to develop a health care plan. In February and March 1993 Bill Moyers's Public Broadcasting Station (PBS) series "Healing and the Mind" was profiled in the print

media as the companion text to the series went on to make the *New York Times Best Sellers* list for 32 weeks. A twelve page special advertising section in *Newsweek* promoting the series (which aired during March) paid for by the Mutual of Omaha insurance company added to the publicity surrounding the exploration of alternative medicine. The success of the series is seen in its rebroadcast throughout 1993 and 1994 on various public broadcasting channels and the fact that it received double the normal ratings for a PBS program.

Moyers (1993) provides transcripts of the interviews seen in the series in the companion text. In his interview with Moyers, Thomas Delbanco, M.D., Director of the Division of General Medicine and Primary Care at Beth Israel Hospital in Boston, Associate Professor of Medicine at Harvard Medical School, Director of the Picker/Commonwealth Program for Patient-Centered Care and founder of the Society of General Internal Medicine, states

> You know, what changed us a lot was acupuncture. We used to curl our upper lip in academic medicine and say, what's that stuff? And then Reston of the *Times* went over to China and was operated on using acupuncture anesthesia. And we sat up and said, "Hey, this is weird, we'd better be more open-minded." Then we began studying it, and we found little chemicals running around in the body, and we said, "Aha! So that what's going on here." We have a scientific explanation for acupuncture now, or we think we're on the edge of it, so we feel better about it (p. 19).

Note that in this passage there is a reference to a specific event when an individual, in this case James Reston of the *New York Times*, while visiting a foreign country had a personal encounter with that country's medical tradition, a classic case of a traveler's tale that just happened to be publicized on a global scale due to the unusual events surrounding the up-coming presidential visit.

It was reported on July 20, 1971 that James Barrett Reston, Vice-President and

Diplomatic Correspondent to the *New York Times*, underwent an emergency appendectomy at the Anti-Imperialist Hospital, Beijing while covering the negotiations for President Nixon's up-coming trip to China. What shocked the American press was that after Reston recovered he summarized his own operation in an article that appeared on July 26 and described how he had been successfully treated with acupuncture anesthesia for post operative pain. It had only been a little more than a month before, on June 6, 1971, that *The New York Times* had reported on acupuncture anesthesia announcing that visiting Americans had made the "recent discovery" that Communist Chinese were using acupuncture as anesthesia; but the topic did not receive much coverage until Reston's operation. Reston, winner of the 1945 and 1957 Pulitzer Prize for National Reporting, is a perfect example of an individual of prominence who's activities, especially while in a foreign country receive media attention.

Herbert J. Gans (1979) states that most foreign news stories fall into seven categories the first being "American Activities in a Foreign Country" which receives the most time and or space "notably when American presidents and secretaries of state visit, and when American diplomats participate in carrying out American foreign policy" (p. 32). Reston, therefore, was in a perfect position to receive news coverage throughout his stay in China. If it can be shown that Reston made an impact on the increase in interest in Chinese traditional medicine, then this one event can be used to support theoretical claims about diffusion of ideas and innovations. For example, one claim that could be supported states that a person of prominence must first be associated with or have been reported to have successfully tried an innovation before the majority of scientists will take interest it the new idea, technique or product.

Corroborating evidence is found in the remarks by Ron Anderson, M.D., Chairman of the Board of the Texas Department of Health and Chief Executive Officer of Parkland Hospital in Dallas, who discusses the attitudes of Western trained Anglo-American physicians toward the Native American healers they encountered and how the Anglo-Americans dismissed the healers' holistic approach as somehow demeaning to their training; however, many have now recognized the important role native healers play. Passages like these appear in several publications discussing culture clash and can be used to support the claim that the process towards a paradigm shift within Western conventional medicine has begun.

Evidence from the Academic Literature

Prior to the airing and discussion surrounding the Bill Moyer's series there were articles that appeared in the academic press that illustrate the concerns about how alternative medicine has been addressed by the medical community at large. The Canadian Medical Association has published several such articles on native healing practices as well as traditional medicine as practiced by various immigrant populations. O'Neill (1989) reports that in a study conducted in 1986 of delivery of health care to Inuit communities across Canada, residents reported that ". . . despite best efforts, and explicit policy directions, cultural differences and language barriers magnify the problems" of patient-physician communication (David 1992, p. 2245).[1] Caregivers who are taught to maintain neutrality and lack of emotional involvement fail to treat their patients' needs and fail to listen and properly interpret their patients' messages. Stewart reports on a March 1992 workshop on traditional native medicine and concludes that the Canadian health care system must change in order to meet the needs of native Canadians who currently account for 40 percent of the inpatient

population.

Pivotal New England Journal of Medicine Study

In January 1993 Eisenberg, Kessler, Foster, Norlock, Calkins and Delbanco published their national survey on the patterns of use of unconventional therapies. Results showed that 34 percent of the 1539 adults surveyed report using at least one unconventional therapy in the past year. Although less than one percent reported using acupuncture, of those who did, 91 percent saw a provider an average of 38 times per year - the highest mean number of visits per user per year of any of the 18 therapies mentioned. The researchers did not distinguish between Western herbal remedies and non-Western; however, 3 percent of respondents reported using herbal medicine while less than 1 percent reported using folk remedies. Similarly, no clarification was given as to what kinds of massage or spiritual healing were sought by respondents so the figures given (7 percent; 4 percent) can only be used as a benchmark. The researchers conclude that unconventional medicine has an "enormous presence in the U.S. health care system" estimating that one third of U.S. English speaking adults used unconventional therapy in 1990 paying providers of such therapies without reimbursement from insurance carriers. This pivotal study is cited throughout the popular literature and business literature (Table 1) and has generated much discussion in the health care debate.

Office of Alternative Medicine

The more visible outgrowth of this growing interest in alternative medicine is the creation of the National Institute of Health's (NIH) Office of Alternative Medicine (OAM) and its conference entitled "Body and Soul: Forum for the Future" held May 20 through May 23, 1993. The *Washington Post* quotes astronaut Edgar Mitchell and

Table 1
New England Journal of Medicine Study

MARCH 1993

EXAMPLE 1: STORY ID: 0000352089ZF
Promoting the merits of alternative medicine.
(Briefings)
PUBLIC RELATIONS JOURNAL, 03/01/93
COPYRIGHT Public Relations Society of America 1993
By Keith Greenberg

. . . .
Indeed, a New England Journal of Medicine survey found that two-thirds of all U.S. citizens use some sort of alternative therapy. "There is definitely a growing interest," said Dr. Daniel Eshkinazi, deputy director of the NIH's new Office of Alternative Medicine.

. . . . Julie Wang, chairman and CEO of Wang Associates Health Communications in New York City, emphasizes that the most important strategy should be "building up credible third-party support," then properly placing the findings in the media. "An article in the New England Journal of Medicine can reach 500 million people overnight," she said. "It would cost between $50,000 and $100,000 to reach this audience through good science, good spokes people and the right types of publications to publicize the data.

JULY 1993

EXAMPLE 2: STORY ID: 0000366994ZF
Healing without doctors. (alternative medicine)
AMERICAN DEMOGRAPHICS, 07/01/93
COPYRIGHT American Demographics Inc. 1993
By Susan Mitchell

. . . . In January, Eisenberg and his colleagues startled the medical world by reporting that over one-third of Americans have turned to alternative therapies.

AUGUST 1993

EXAMPLE 3: STORY ID: 0000268720DC
From acupuncture to yoga, alternative healing gains ground
LOS ANGELES TIMES, 08/22/93
Copyright The Times Mirror Company; Los Angeles Times. All Rights
By David R Olmos 1009

. . . . Of the $13.7 billion Americans spent on alternative care in 1990, a whopping $10.3 billion was paid out of pocket without reimbursement by insurance plans, according to a study published in January in the New England Journal of Medicine.

. . . . Eisenberg's study--which provided the first statistical evidence to support alternative practitioners' claims that many Americans were benefiting from their services--also caught the attention of many insurers.

< In what observers say is probably the first insurance policy of its kind in the nation, American Western Life Insurance Co., based in Foster City, Calif., recently began offering coverage for alternative medical treatment. >

NOVEMBER 1993

EXAMPLE 4: STORY ID: 0000287350DC
Alternative medicine gaining popularity
THE BUSINESS JOURNAL-SACRAMENTO, 11/01/93
Copyright The Business Journal, Serving Greater Sacramento 1993
By Raymond Dussault

. . . . While Washington argues over how to pay for a proposed national healthcare system, consumers have waged a quiet revolution, demanding a say in the types of healthcare available by voting from their pocketbooks.

Americans spent $13.7 billion on unconventional medical treatments in 1990, researchers reported in a January 1993 study published in the prestigious New England Journal of Medicine. The study also found that the bulk of the expenditures, a full three- quarters of the total, were not covered by insurance and were paid for out of pocket by the consumer.

DECEMBER 1993

EXAMPLE 5: STORY ID: 0000369061ZF
New support for old therapies. (growing acceptance of alternative medical techniques)
FORBES, 12/20/93
COPYRIGHT Forbes Inc. 1993
By Richard Phalon

. . . . Establishment doctors who dismiss therapies like acupuncture and herbal healing as quackery might benefit from a second opinion on what is happening in the medical marketplace.

DOES DOCTOR really know best? Not always, it would seem, if you take into account the increasing respectability being won by such nonconventional therapies as acupuncture, biofeedback, chiropractic and herbal medicine. In other cultures these therapies have been standard practice for ages, but most physicians educated in schools approved by the American Medical Association and affiliated with AMA hospitals have long dismissed these techniques as quackery. Today, however, signs of a new approbation for alternative medicine are everywhere. Among them:

A clear drift of market forces. A survey team headed by Dr. David Eisenberg, who teaches a course in alternative medicine at the Harvard Medical School, reported in the Jan. 28, 1993 New England Journal of Medicine the Americans made an estimated 425 million visits to nonconventional practioners (sic) in 1990--about 10% more than the 388 million visits logged by all U.S. primary care physicians.

JANUARY 1994

EXAMPLE 6: STORY ID: 0000376177ZF
Alternative medicine: the facts.
CONSUMER REPORTS, 01/01/94 COPYRIGHT C
Consumers Union of United States Inc. 1994 008

. . . . Despite the difficulties, researchers have now taken the first steps toward defining what "alternative" medicine encompasses, and have begun to estimate how many Americans are using it. The watershed study - done by David Eisenberg, and internist at Harvard Medical School, and his colleagues - appeared in the New England Journal of Medicine in January 1993. It defined "unconventional therapies" as "commonly used interventions neither taught widely in U.S. medical schools nor generally available in U.S. hospitals."

EXAMPLE 7: STORY ID: 0000376178ZF
Acupuncture. (alternative medical treatment) (includes related article)
CONSUMER REPORTS, 01/01/94

. . . . Meanwhile, Western researchers as well as acupuncturists are acknowledging the difficulties of doing placebo-controlled studies of acupuncture and are looking for other scientific ways to test its merit. Dr. David Eisenberg of Harvard Medical School, who has surveyed the use of alternative medicine, suggests that researchers could compare the results of acupuncture to those of conventional treatment, or test whether acupuncture in combination with another therapy is more effective than the therapy alone.

others as viewing the revolution or evolution in Western medicine to accepting alternative medicine as a paradigm shift. The conference was sponsored by the National Institute of Health's Office of Alternative Medicine, the National Museum of Health and Medicine, the U.S. Botanic Garden, and the National Wellness Coalition, a nonprofit, public-interest umbrella organization. Cosponsors were the Taoist Health Institute and the Center for Natural and Traditional Medicine. One of the key panelists at the May 21 session on Wellness and Health Care Reform was Brian Berman, "a family practice physician certified in traditional Chinese medicine and homeopathy and director for eight years of a London clinic offering an "integrated" program of traditional and nontraditional medicine" who "now directs the University of Maryland School of Medicine Pain Center, which is integrating orthodox and complementary medicine as a long-term research project". A "town meeting with representatives of Congress and the administration" and "Wellness networking" was also held on May 21, 1993.

The Office of Alternative Medicine was, according to the OAM's General Information Sheet, "initiated through Congressional mandate under the Fiscal Year 1992 NIH Appropriates Bill". Dr. Joseph J. Jacobs, Director of the OAM (1992-1994), along with his staff spent the first year "identifying the Alternative Medicine community and the barriers to the evaluation of alternative medical practices"[2]. In June 1992 the OAM organized an *ad hoc* committee of people familiar with alternative medicine. In September 1992 a planning workshop was held to assist the NIH in establishing a research agenda for the OAM. Ten working groups identified six categories of alternative medical practices: 1) diet/nutrition/lifestyle changes; 2) mind/body control; 3) traditional and ethnomedicine; 4) structural and energetic

therapies; 5) pharmacological and biological treatments; and 6) bioelectromagnetic applications. The panel met again in April and July 1993 to discuss the "cross-cutting issues" such as research methodology, the peer review process, research and training needs, and information dissemination activities that they had identified the year before. A report on the status of Alternative Medicine in the United States was to be issued in early autumn 1994.

The OAM's budget was $2 million in Fiscal 1992, another $2 million in Fiscal 1993 and $3.5 million in Fiscal 1994. In 1992 the OAM co-funded eight grants with other NIH Institutes for research that addressed issues surrounding the problems of cancer, perimenstrual syndrome, perinatal care and cardiac patient recovery, stress management, diet, exercise, therapeutic touch, biofeedback and novel pharmacological approaches. In October 1993, after having received 800 letters of intent and 452 completed applications, a peer review committee announced a total of 30 grants for up to $30,000 each. Of interest here are the eight grants for the exploratory studies of non-Western healing (Table 2).

The Business Literature

In addition to reports in the popular press and general interest television programming, there are a number of parallel reports on alternative medicine in the business literature. It is proposed that one of the main reasons for coverage by the business press is the result of competition within the pharmaceutical industry to be one of the first to discover a cure for or a vaccine against a given disease. Outcomes of such a quest can be seen in the actions taken by specific pharmaceutical companies. Merck has publicized its purchases of rainforest tracts in order to preserve plant and animal life for current and future research. Shaman Pharmaceuticals is another

Table 2

Category	Modality	Condition	Institute	Award
III.1	Acupuncture	unipolar depression	U of Arizona/Tucson	$29.585
III.1	Acupuncture	attention-deficit hyperactivity disorder	Med College of Virginia	$30,000
III.2	Ayurvedic herbals	Parkinson's disease	Southern IL U Sch of Medicine	$29,965
III.2	Ayurvedic	health status	SHARP Healthcare, San Diego	$30,000
III.	Hatha yoga	illicit drug use	Harvard Medical School	$30,000
III	Yogic breathing	obsessive-compulsive disorder	U of Calif., San Diego	$30,000
III	T'ai chi	mild balance disorders	Northwestern U, Chicago	$29,711
IV	Qi gong	intractable reflex sympathetic dystrophy	UMDNJ - Newark	$30,000

company that has publicized its efforts to save rainforest tracts by reimbursing indigenous peoples for their cooperation in aiding Shaman's researchers.

Shaman Pharmaceuticals, founded in March 1989 with two employees, began operations in May 1990 and went public on the NASDAQ in late 1992 with 46 employees. The company was profiled in October 1993 on ABC's nightly news as being specifically focused on bringing to market drugs extracted from medicinal substances currently found within the materia medicae of shamans, medicine men and women, healers and folk medicine practitioners. In a June 6, 1993 article in *Times* Barry Kaye writes that Shaman Pharmaceuticals, by "Working in the darkest jungles of both Africa and South America,...is hoping to find cures to modern diseases by unlocking the medicinal secrets of ancient Indian cultures". Kaye notes that "Not only must researchers develop trust of local medicine men, or "shamans," but time is also a factor: Western encroachment is eroding both the environment and a way of life where nothing is written down". Kaye quotes Lisa A. Conte, Shaman's Chief Executive Officer, as stating "This knowledge is at as great a risk of extinction as the rain forest (sic) itself". Kaye's profile is significant to this study because he clearly summarizes points that can be interpreted as indicating that a paradigm shift in pharmacology is occurring due to recent technological advances:

> What makes the search even more poignant are advances in technology, which allow for the rapid screening of molecules to determine a plant's curative powers. Efforts that previously took years to complete can now be done in a matter of weeks. One Shaman product currently under development--a vaccine for respiratory viral infections in children--would have been impossible to isolate five years ago, according to Conte. Other biotechnology breakthroughs that have come from tropical plants include L-dopa, used in the treatment of Parkinson's disease, and vincristine, an anti-cancer agent made from a tiny rain forest flower (Dow Jones).

Kaye quotes Gordon Cragg, a researcher with the National Cancer Institute

based in Bethesda, Maryland as stating that "Nature provides all the interesting new structures that chemists would never dream up". Kaye's words can also be used to clearly stake the claim that the amount of publicity given to the plight of the rainforests is not unwarranted.

> Adding to the rain forest's potential is the fact that it contains more than 50 percent of the earth's plant life, yet less than 1 percent has been studied by Western researchers. One reason is that, although many of today's pharmaceutical firms began by analyzing individual plant compounds, the trend in recent years has been toward mass screening of molecules. That requires huge investments in both time and money, something Shaman is hoping to avoid (Dow Jones).

Steven King, an ethnobotanist with the company, stated "that of the 200 compounds Shaman has brought back from the jungle since the company was founded four years ago, approximately half show some sort of medicinal value" which "compares with a hit rate of less than 1 percent from mass-screening". Kaye concludes his article with several other quotes and references to Merck's and Eli Lilly's acceleration of their research efforts into finding new drugs before the plants become extinct. One such drug is Taxol, derived from the yew tree. Kaye states that "One estimate puts the potential worldwide market for drugs developed from tropical plants at $900 billion". Although the figures are based on medicinal substances derived from tropical plants and medicines currently being used by primitive societies, these estimates for potential profits lead to the speculation that similar profits can be made from the development and international marketing of drugs made from all non-Western pharmacopeia.

Nevertheless, there are many obstacles to successful development of any new drug. According to a story posted on the Dow Jones News Service on August 4, 1993 "Herbalife International Inc.'s Thermojetics weight loss product may be closely

scrutinized by the Food and Drug Administration (FDA) because of a Chinese herb in the product". Shipments of the Inglewood, California's Herbalife's successful product were "suspended in Canada earlier this year while the Canadian government studied the levels of ephedrine, a crystalline alkaloid, that occurs naturally in the herb known as `Ma Huang'".

According to a filing with the Securities and Exchange Commission, "Canadian authorities have said the product can be reformulated with reduced levels of ephedrine. Herbalife resumed shipping of the product in Canada in June after the reformulation notice came from Canada". The Dow Jones report notes that the filing states that "If the product comes under FDA scrutiny, Herbalife might have to reformulate Thermojetics with reduced ephedrine levels or a substitute" the filing said. In an article appearing on August 6 in the *Wall Street Journal* Herbalife International Incorporated shares "tumbled 15.8% on news the Food and Drug Administration may force the company to reformulate its weight-loss product". According to Lubman, "An FDA official said that the agency has repeatedly publicized concerns about the herb, and has sent information to Congress about it" stating that "`Serious adverse effects including hypertension, palpitations, neuropathy, myopathy, psychosis, stroke, and memory loss have been reported to the FDA with products containing Ma Huang'".

Such examples highlight the difficulties and expenses involved in trying to take medicines that have been used by other peoples in other cultures and formulate and manufacture them to standards that meet the FDA's criteria. The case can be made, therefore, that interest in the medical benefits derived from both traditional and non-Western medicine has grown. There is definitely sufficient evidence that the media are publicizing alternative medicine presumably because journalists believe that there

is enough public interest and dissatisfaction to justify print, radio and television coverage[3]. It is assumed that media reports often appear as scientists begin publicizing their research. There should be evidence then for an increase in the amount of published research on non-Western medicine. It is assumed that the paradigm shift within the pharmaceutical industry has already occurred as evidenced by the fact that such substances are being tested and developed for market; however, the shift within the scientific community as a whole to accept such drugs may not have yet occurred.

Debate on Health Care Reform

As 1993 progressed there was further evidence of a growing interest in health care issues related to the discussion of Hilary Rodham Clinton's National Health Care Reform Bill, which was formally presented to the United States Congress in late September. At first it seemed that the debate would be opened up to public discussion about the quality of the United States' health care system and about issues surrounding the biomedical model. For example, *Newsweek*, *U.S. News & World Report* and *Time* each ran special issues on the health care issue. One such article reported research by sociologists John and Sonja McKinlay. The McKinlay report indicates that 90 percent of the progress in modern medicine occurred during the first half of the twentieth century. For instance,

> Four out of nine leading scourges (TB, typhoid, measles and scarlet fever) were already well under control by the time vaccines or treatments came into wide use. And the death rates for four others (flu, pneumonia, whooping cough and diphtheria) declined at basically the same rates before and after technology delivered a fix. Despite the major exception of polio - which plummeted after vaccines came into use in the mid-'50s - the McKinlays calculate that less than 4 percent of the decline in mortality between 1900 and 1973 resulted from medical measures. The real breakthroughs, scholars now agree, were better housing, hygiene and nutrition (Cowley, 1993, p. 60).

Modern medicine, has therefore, been credited with more success than it may possibly

deserve, leading one to believe that the reason the paradigm has not changed is that it had not been challenged until recently. Early signs of such a challenge can be seen, for instance, in articles discussing the need to re-examine the physician-patient relationship. A movement is emerging that advocates that the patient question his or her physician's expertise and credentials, empowering the patient to take charge of his or her own treatment. For example, Anne Scheck in an article entitled "Do You Know if Your Doctor's Any Good?", published on the front page of the April 14, 1994 issue of *Investor's Business Daily,* asks the reader to question his or her own reasons for staying with a particular physician:

> Your physician has the kind of crisp demeanor you respect and trust. The doctor's receptionist punches in your appointment on a state-of-the-art computer, and even the waiting-room magazines are up to date.
> The best part: your visit only takes a few minutes. Then, prescription in hand, you're on your way.
>
> Well, if you think you're lucky, think again. Professional appearances and brevity don't tell you much about whether you've had good medical care.
>
> And as for the prescription...Were you handed that piece of scribbled paper without hearing a tentative diagnosis? Was the prescribed drug identified and explained? Were you asked if you were taking any other medication that might interfere with its effect?
>
> The surprising truth is that Americans rarely question their medical care, particularly when they feel rapport with their health-care provider. And while a good personality is a valuable asset, it's not on the list of desired physician credentials compiled by health-care organizations ranging from the American Medical Association to Aetna Health Plans.
>
> . . . . More than a third of the 650,000 U.S. physicians aren't board-certified according to a 1992 tally by the AMA. About 30,000 are board-certified, but not for the field they practice in (p. A1-A2).

Scheck concludes by recommending that everyone take the time to ask his or her doctor about his/her hospital affiliations and license status.

Reports also appeared in various publications announcing findings on non-Western herbal remedies such as the one published in *Health.* The news item stated that "Parasitologist Steven Meshnick and his colleagues at the University of Michigan

studies (sic) 638 malaria patients in Vietnam and found that artemisinin, an ancient Chinese herbal remedy for fever, wiped out the malaria parasites, worked faster than Western drugs, and had no side effects" (p. 29). The key point made here is "no side effects". As more and more reports appeared in the popular media it became evident that journalists were either seeking out reports to support the acceptance of alternative and non-Western medicine or were reporting on a growing movement toward acceptance as the health care debate expanded. Unfortunately, the debate became a battle over Hillary Rodham Clinton's tactics and eventually focused only on the health care alliances and insurance reform, losing all vision of the broader issues surrounding medicine as a whole.

Evidence from the Popular Media

These reports were followed by a series entitled "Heart of Healing" hosted by Jane Seymour on TBS the week of October 24, 1993 along with The Discovery Channel's "Spirits of the Peruvian Rainforest" (aired October 26) accompanied by a special *Destination Discovery: The Magazine of the Discovery Channel* October issue on rainforests. These programs, in addition to movies such as "Medicine Man", starring Sean Connery, are products of a growing interest in the movement to save depleting rainforests, swamps and other ecological habitats for many reasons.

In addition to the message embedded in these programs about the need to save indigenous plants for their potential medicinal benefits, there is clear evidence of dissatisfaction with the medical community. This dissatisfaction was expressed throughout the program aired on TBS. After profiling the wonders of modern medical technology, Jane Seymour, the host of "Healing and the Heart" states

The miracle of modern medicine has a downside. It tends to treat symptoms

> well but is less successful with the underlying causes and mechanisms of chronic diseases like AIDS, arthritis, most cancers; all still considered incurable. Its very efficiency can seem cold, impersonal in treating our bodies like machines to be fixed by increasingly clever technology. In this view death is a defeat.
>
> But we're a part of this. As patients we've come to depend on quick fixes from our doctors, magic bullets, miraculous surgery. We have a medical system that reflects our society. All over the world wherever technology goes we risk losing sight of the whole person and forgetting the body's natural ability to heal itself. But there is another approach; one that recognizes the crucial role in healing that is played by the human mind and spirit, not only in chronic disease but in the emergency room.

That other approach, commonly referred to as alternative medicine, covers a broad spectrum including herbalism, faith healing and non-Western medicine as seen in the categories identified by the OAM. Fulder (1987) writes in a summary of a 1986 UNESCO report that complementary medicine, also called natural, alternative, traditional or unconventional, encompasses a variety of therapeutic systems such as acupuncture, chiropractic, healing, herbalism, homeopathy, hypnotherapy, therapeutic massage, naturopathy and osteopathy.[4] *Index Medicus*'s tree structure for "Alternative Medicine" adds anthroposophy, biofeedback, color therapy, diet fads, eclecticism, electric stimulation therapy, mental healing, moxibustion, radiesthesia, reflexotherapy, rejuvenation, relaxation techniques, music therapy, and tissue therapy. *Index Medicus* lists yoga, acupuncture, and Drugs - Chinese Herbal separate from those under Medicine -, i.e. African Traditional, Arabic, Ayurvedic, Herbal, Chinese Traditional, Oriental Traditional, *Yin-Yang*, and Traditional.

Fulder explains that in traditional medicine the patient is treated as an individual. "There is little interest in statistical or population norms; instead the individual is his or her own point of reference" (p. 17), which is in contrast to the dominant medical paradigm of specificity. According to Fulder,

> The specificity approach achieved complete dominance during the last century, after a bitter struggle. The traditionalists called the new practitioners quacks, and modern medicine replied by ridiculing the traditionalists' arcane doctrines and witches' brews...The spectacular results of aspirin, digitalis, quinine and opium left the traditionalists with their principles but no patients. The traditional systems were effectively outlawed all over the modern world" (p. 17).

Fulder makes the point that conventional medicine is now experiencing a significant level of failure in treating chronic conditions, "often musculoskeletal problems connected to lifestyle, such as back pain and arthritis, chronic pain such as migraine or neuralgia, chronic infections such as bronchitis, ulcerative colitis, urethritis, allergic conditions, fatigue, insomnia and debility, cardiovascular problems and stress-related disorders" (p. 19). Fulder implies that as patients become more and more disillusioned with their doctor's inability to cure such conditions, many lose faith in conventional medicine and return to traditional and/or alternative treatments.

Writing for the general public Tom Monte and the editors of *EastWest Natural Health* present a guide to six traditional medical systems. Echoing the sentiment expressed by Fulder and in Jane Seymour's introduction to the TBS production, Monte (1993) writes that

> Today, modern Western medicine stands as a monolith on the world stage. Few other spheres of human endeavor have developed so rapidly and in so singular a fashion. In the U.S., it employs millions of people and accounts for a huge share of the country's gross national product. In terms of its sheer influence over the daily life of most people, the health care industry is perhaps unrivaled.
>
> Ironically, modern medicine is now in the throes of a revolution, in part because the disease patterns of the Western world have changed. Today, the leading causes of death in the U.S. are no longer infectious diseases but degenerative ones, such as illnesses of the heart and arteries, cancer and diabetes. Studies have determined that these illnesses are caused primarily by lifestyle factors, such as dietary habits, stress, and patterns of thinking, feeling, and behaving. . . .
>
> Though most of orthodox medicine adheres stubbornly to its technological and pharmaceutical methods, a new and powerful trend is underfoot, which

> emphasizes the prevention of illness, and the use of simpler, noninvasive methods of healing (p. 56).

These same sentiments have been expressed occasionally in the medical literature, as well, as seen in an article by Derrick B. & E. F. Patrice Jelliffe, Division of Population, Family and International Health, School of Public Health, University of California. Jelliffe and Jelliffe in a 1977 article in *Transactions of the Royal Society of Tropical Medicine Hygiene*, entitled "The cultural cul-de-sac of Western medicine (Towards a curvilinear compromise?)" state

> So-called Western culture has roots in many other past civilizations but in its modern form arose in parallel with, and as a product of, the Industrial Revolution. This new Westernism can be categorized as "linear", and characteristically has a self-image of being direct, efficient-seeming, dramatic, numerically provable, speedy. It is also impatient, narrow spectrum and technology-based and, until recently, was ebullient, assured, forceful and aggressive. However, recent limitations, unexpected side effects and failures have lead in some quarters to an over-reactive scientific *anomie* unthought of 20 years ago (p. 331).

Jelliffe and Jelliffe then proceed to outline the history of this "hubris", as they call it, and list 9 indicators of the failure of the system:

1) complete or partial failure in some areas of pathology
2) increasingly common recognition of iatrogenic (negative side effects) ill effects
3) transience of the success of some approaches
4) excessive cost and complexity, with distorted deviation of limited resources
5) awakening of awareness of the existence and potential value of some aspects of other systems of health care (e.g. Chinese acupuncture, Indo-Japanese techniques of meditation, etc.)
6) widespread reaction towards "naturalism" (i.e. breast-feeding, natural foods movement)

7) disillusionment with continuous "medical break-through" science-fiction type journalism with miracles promised, but often with little effect or consequences to the public at large

8) growing concern for health to be viewed "holistically"

9) criticism of the financial-medicalization of health

It is not unreasonable, therefore, to expect to find evidence of increasing dissatisfaction with Western medicine and possible changes taking place within the biomedical model.

SECTION III: MEDICAL TRADITIONS

"Sensitivity to the role of paradigms in our perception can be an important tool in problem solving. Once we know that all our problems cannot be solved within the frame of a current paradigm, then it is sometimes possible to solve a problem by reframing its terms" - Schwartz and Ogilvy, 1979.

Medical Models

Medical models or paradigms serve as a frame within which health care providers and medical researchers view how the body works and how the mind functions. Every culture throughout time has had to find ways to treat bone fractures, wounds inflicted during battle, and wounds and trauma inflicted by nature and/or accidents. All peoples have had to face the problems that often arise during the birthing process and everyone has had to combat illness and disease. Consequently, each community has developed its own health care hierarchical system demarcating the roles of surgeons, separate from bone-setters, separate from herbalists separate from mid-wives and separate from diagnosticians. Rarely, however, are these medical models outlined and compared from a macroperspective. Almost all of our medical histories and ethnographies have viewed health care systems from a microperspective. No one seems to have viewed medical systems as scientific paradigms but paradigms they are.

Biomedical Model

The conventional Western medical model is a relatively recent paradigm developed in the middle nineteenth century. According to James Burke, the BBC author, producer and presenter of a series of programs on the history of science, "Before the early years of the nineteenth century the nature of disease was unknown, except as a list of symptoms each of which was the manifestation of the single

`disease' that attacked each body separately and produced individual effects" (p. 306). This changed with the dramatic change in the role of the surgeon during the French Revolution and the "use of recently developed probability theory combined to produce a new concept of disease as a localised phenomena" (p. 306). Burke writes that

> . . . In the new medical practice the bedside manner gave way to hospital techniques and a consequent loss of involvement on the part of the patient in the diagnosis and treatment of his ailment.
>
> As medical technology advanced it became unnecessary to consult the patient at all. Information on the nature of his illness was collected at first without his active participation, and later without his knowledge or understanding. Along with these changes came the great medical discoveries of the nineteenth century and dramatic improvements in personal and public health. By the end of the century the doctor had assumed his modern role of unquestioned and objective arbiter. Patients had become numbers (p. 306).

James J. Lynch (Professor and Scientific Director of the Psychophysiological Clinic and Laboratories at the Institute of Psychiatry and Human Behaviour at the University of Maryland School of Medicine) and Paul J. Rosch (President of the American Institute of Stress and clinical professor of Medicine and Psychiatry) write that the Western medical model was shaped to a great extent by René Descartes "who made a sharp distinction between problems affecting the mind or Spirit, and those which affect the body" (Lynch & Rosch 1990, p. 34). Lynch and Rosch state that Descartes "viewed disease and illness as the result of some mechanical failure of the body machine" (p. 34). Lynch and Rosch cite LaMettrie's 1960 work *L'Homme Machine"* in writing that the physician was to focus on "finding and fixing" medical problems (what were considered to be "defects") by "increasing his knowledge of how the smallest component parts of this complicated machine operated, much like learning how a clock works" (p. 34). Citing Ryle's 1950 *The Concept of the Mind* along with J. J. Blom's 1978 *Descartes His Moral Philosophy and Psychology*, Lynch and Rosch

conclude that because Descartes viewed the mind as "some sort of ghost in the body-machine" his views helped to foster the "present mechanistic, reductionistic approach to illness which assumes that only by learning how the smallest parts of the body machine functioned, could we learn how to repair the effects of externally caused illness" (p. 34). Despite the acknowledged advances in medical technology, surgery and understanding of the disease mechanism, Western medicine has been "persistently preoccupied with the epidemiology of illness" as "something that has been thrust upon us from outside" despite numerous research studies and writings from ancient Rome on up through today that have noted that there is a link between emotions, behavior, stress and illness (pp. 31-36).

Within the modern Western model, therefore, the main orientation is toward a disease model based on the Pasteur model of infectious disease. There is no emphasis on host factors (i.e. subject characteristics) such as the patient's state of mind, ethnicity, gender, religious beliefs, world view or spiritual state, e.g. karma, level of mastery of meditation, et cetera. There has been no emphasis on diet or on the prevention of illness until quite recently.

The model, although reductionistic, is based on the belief that all scientific models should be simplistic, elegant and parsimonious. By being reductionistic it fails in that it treats only the etiologic agent of disease or the effects of the disease process and has no impact on the patient's lifestyle or state of mind. Candace Pert, Peptide Research in Rockville, Maryland and former Chief of the Section on Brain Biochemistry of the Clinical Neuroscience Branch at the National Institute of Health, in referring to how science will reconcile the connection between the mind and the body, states that what is lacking in the medical model might come from the field of

physics

> . . . because clearly there's another form of energy that we have not yet understood. For example, there's a form of energy that appears to leave the body when the body dies. If we call that another energy that just hasn't been discovered yet, it sounds much less frightening to me than `spirit.' Remember, I'm a scientist, and in the Western tradition I don't use the word `spirit'. `Soul' is a four-letter word in our tradition. The deal was struck with Descartes. We don't invoke that stuff. And yet too many phenomena can't be explained by thinking of the body in a totally reductionist fashion (Moyers p. 182).

Until recently this reductionist model was not questioned.

In an interview with Moyers, Ron Anderson expresses his view that the Western model does not take into account the role of the mind in the healing process. "People in medicine want to get a statistical P-value or student T-test, or they want to at least see it all stacked up on the wheelbarrow so they can count it. But I know in my practice that I see people get better because of the caring relationship" (Moyers, p. 26). Anderson further describes Western medicine by claiming that

> Traditionally, hospitals have been organized for doctors, for auxiliaries, for insurance companies - everybody but the patient...Although we have advanced technology and spend a lot, this nation is not satisfying its patients. We're the only country where the more we spend, the less people are satisfied with health care. There's a reason for that - patients tell us that they want a more personal relationship with their doctors (p. 31, 33).

David Smith, M.D., Commissioner of the Texas Department of Health summarizes the model as

> Our traditional focus is on individual body parts. We look at your lung, we look at your kidney, we look at your stomach, we look at your brain. You've got a different doctor for every organ. We never put it all back together for you, let alone for ourselves, Then what we do is treat the particular organ system . . . . Because another doctor has given you a pill for your heart, and you don't know how the medicine for the kidneys might affect the heart. You might ask your kidney doctor, but you'll get the reply, "Gee, I don't know, I'm only the kidney doctor" (Moyers, p. 62).

According to Jon Kabat-Zinn, Ph.D., Founder and Director of the Stress Reduction

Clinic at the University of Massachusetts Medical Center and Associate Professor of Medicine in the Division of Preventive and Behavioral Medicine at the University of Massachusetts Medical School, modern Western medicine began with the Cartesian split between the mind and the body in the early seventeenth century. Kabat-Zinn states

> Over the past several hundred years we've tended to look at disease as being more or less a function of the physical body, and to look at thoughts, feelings, emotions, and social interactions as being in the domain of the mind. For the most part, we've thought that the disease process is independent of the mind . . . In this model you diagnose what's the matter with the body, treat it, and then get on with your life (Moyers, p. 130).

More and more medical authorities are openly discussing the negatives of this particular aspect of the Western model which is becoming difficult to describe in a positive light nor from a neutral stance especially when faced with such condemnations of the system by Kabat-Zinn that what we have in the United States is not a "health care system" but a "disease care system" (Moyers, p. 134).

Dean Ornish, M.D., Assistant Clinical Professor of Medicine, President and Director of the Preventive Medicine Research Institute at the School of Medicine, University of California, San Francisco cites Kuhn's *Structure of Scientific Revolutions* in his interview with Moyers. Ornish interprets the framework of Western medicine as an outgrowth of the dominance of first the Catholic Church and its successor science. Astronomical anomalies that could not be explained by the Church were explained by Galileo and subsequent scientists, gradually diminishing the authority of the Church. Ornish sees his view of Western medicine as an outgrowth of the scientific method:

> If we can't measure it, it doesn't exist, and it's not real. But like the telescope, new tools are beginning to show us anomalies in our worldview. To me the anomalies are the most interesting part. But they can also be viewed as threatening. More often than not, people want to suppress that information, or

> they want to discredit it, or they want to kill the messenger, so to speak . . . You find different models emerging now. You find the holistic health model, or the religious model, or the so-called scientific model. But none of those models gives us a complete picture. They're all powerful, and they all have their uses, but they also, by definition, all have their limitations (Moyers, p. 104).

The lack of a universally accepted Western model of medicine is clear from Ornish's point of view. Most physicians would probably agree, however, that Western conventional modern medicine as practiced since the 1940s is intricately linked to the scientific method and that most of the research in the field focuses on minute aspects of the body's functions and on the direct observation of chemical and bacterial processes in the treatment of disease. There is no attempt to model the body and mind in the same way that physicists have attempted to model the universe nor is there any scientifically sanctioned inclusion of anything that most scientists would classify as falling into the category of religion, i.e. mind - spirit - soul.

Biopsychosocial Model

The only exception to the above is the work of George L. Engel, Emeritus Professor of Psychiatry and Internal Medicine, who in 1977 proposed what he called the biopsychosocial model in *Science*. Engel quotes fellow psychiatrist Ludwig's 1975 statement that psychiatry in the mid-1970s had become a "hodgepodge of unscientific opinions, assorted philosophies and `schools of thought'" (Engel 1977, p. 129). This Engel felt was the general sentiment expressed at a conference on psychiatric education, noting that the prevailing view was that medicine, having a "firm base in the biological sciences", new technologies and new treatments, was a superior science because of its apparently successful medical model of disease.

Unlike his colleagues at that time, Engel felt that medicine itself was in crisis

and that

> . . . medicine's crisis derives from the same basic fault as psychiatry's, namely, adherence to a model of disease no longer adequate for the scientific tasks and social responsibilities of either medicine or psychiatry. The importance of how physicians conceptualize disease derives from how such concepts determine what are considered the proper boundaries of professional responsibility and how they influence attitudes toward and behavior with patients (p. 129).

Engel summarizes by challenging both medicine and psychiatry

> . . . despite the enormous gains which have accrued from biomedical research, there is a growing uneasiness among the public as well as among physicians, and especially among the younger generation, that health needs are not being met and that biomedical research is not having a sufficient impact in human terms. This is usually ascribed to the all too obvious inadequacies of existing health care delivery systems. But this certainly is not a complete explanation, for many who do have adequate access to health care also complain that physicians are lacking in interest and understanding, are preoccupied with procedures, and are insensitive to the personal problems of patients and their families. Medical institutions are seen as cold and impersonal; the more prestigious they are as centers for biomedical research, the more common such complaints (cites Dugg & Hollingshead 1968). Medicine's unrest derives from a growing awareness among many physicians of the contradiction between the excellence of their biomedical background on the one hand and the weakness of their qualifications in certain attributes essential for good patient care on the other (cites self 1974). Many recognize that these cannot be improved by working within the biomedical model alone.
>
> The present upsurge of interest in primary care and family medicine clearly reflects disenchantment among some physicians with an approach to disease that neglects the patient (p. 134).

Citing Holman 1976, Engel goes on to outline the negative results of "biomedical dogmatism" in similar terms to those already cited (Table 3).[5] Working under the assumption that the biomedical model has failed, Engel suggests that his biopsychosocial model utilizes Von Bertalanffy's General Systems Theory Perspective and takes folk models, environmental, social, psychological and biological factors into account when evaluating a patient holistically and recommending a course of action which may involve referral to another practitioner. Engel does not go so far as to include alternative/complementary medicine however.

Table 3

Negative Outcome of Biomedicine	Cited by
Overuse of Drugs	Engel 1977 p. 134
Excessive Surgery	Engel 1977, p. 134
Inappropriate utilization of diagnostic tests	Engel 1977 p. 134
Insensitivity towards patients	Engel 1977, p. 134
Cold, impersonal	Seymour TBS, 1993 Kabat-Zinn - Moyers 1993
Mechanistic view of living organism	Seymour TBS, 1993 Kabat-Zinn - Moyers 1993
Separation of mind and body	Engel 1977 Seymour TBS, 1993
Ineffective/failure to treat chronic conditions and diseases	Seymour TBS, 1993 Monte 1993, p. 56
Limited patient-physician communication and/or interaction	Burke 199 , p. 306 Anderson - Moyers 1993 Smith - Moyers 1993
Reliance on statistics	Burke 199 p. Ornish - Moyers 1993

Engel in 1977 did not mention human spirit but more recent proponents have. In May 25-26, 1989 in Rotterdam, the Netherlands, at the opening of the Helen Dowling Institute for Biopsychosocial Medicine, a group of participants at an international meeting called for a paradigm shift within Western medicine. Marco J. De Vries, Professor of General Pathology at Erasmus University Rotterdam, and General and Scientific Director of the Helen Dowling Institute, states that in 1989 psychosocial factors were still considered to be of "marginal import for the susceptibility to and the treatment of disease" (1990, p. 65). De Vries concludes by calling for a new model that may "contribute to the emergence of a new and modern spirituality. This spirituality is concerned with the values of human dignity as reflected by autonomy, care and compassion as expressed through social support, recognition of the uniqueness of the person and those who suffer, which may lead to purpose and meaning in life for all concerned, patients as well as health professionals" (p. 76). It is this interpretation of what a new medical model should be that will be presented here as what the non-Western model already entails noting that Engel's model highlights the biomedical component whereas the non-Western model does not.

Non-Western Medical Model

The non-Western model is, as an exact opposite to the Western model, exceedingly complex and includes elements which in many instances cannot be translated into English. The model, suffused with religion and sympathetic magic, includes a cosmic world view of the patient as an element in the universe interacting with various invisible forces. Thus, the patient is viewed as an agent whose spirit, soul, aura or karma is affected and affects the body's functioning and overall health. For example, Majumdar (1971) writes

> Vedic treatment often follows a set formula of propitiation of the angered gods, appeasement of malignant forces, magic formulas with the auxiliary use of material remedies like amulets, external applications and internal medicines . . . a psychiatric approach in the shape of frequent appeals (by suggestions and mesomeric repetition) to the patient who is constantly assured of progressive healing and ultimate care . . . (p. 218).

Thus, the models can be shown as:

Western Algorithm I:
agent + host = disease
doctor → disease (agent + host) = host/agent + reaction
experiment → host + Rx = cure
Rx + host → (delete disease) = cured patient
or
Rx + host → (undelete disease) = sick or dead patient
Non-Western Algorithm I:
Physician + Spiritual healer (shaman, medicine man/woman, prayer leader) - diagnose both illness, cause of the illness, (i.e. unsanitary living conditions, parasitic infection and cosmic cause, battle between the forces of nature, possible deeds, thoughts or negative feelings that may have offended spirits - contact with entities)
Non-Western Algorithm II:
Physician + Spiritual Healer + Patient → diagnose an imbalance and prescribe a holistic cure
Non-Western Algorithm III:
Universe < deities, ancestor spirits, negative and positive entities, forces of nature, elements, battle between good and evil
Human < body, soul, mind > must be in balance, subject to assault by forces, fate, retribution

Animal < body, soul, mind > subject to abuse by human caretakers, may be cursed by human sorcerers to fall ill or produce deformed offspring, or in the case of milk producing mammals - less milk or sour milk
Microbes, parasites, fungi, bacteria - agents of illness but also agents of cures

Humans may fall victim to a parasite or microbe through no fault of their own or may fall victim to disease as the result of a curse, a failure to maintain balance between the forces of nature, or as a victim of divine or ancestor retribution (possible punishment for past deeds in previous incarnations [existences]). Foster and Anderson (1978) refer to this system as the personalistic. Such beliefs predominate in the medical and health data "recorded in classical ethnographic monographs on `primitive' peoples", although they were common among the complex civilizations of West Africa, the Aztec, Maya and Inca (p. 55).

Another system, the naturalistic, believes that disease occurs when there is an imbalance within the body's metabolism, within a specific organ or within the circulatory system or other regulatory system such as breathing. Naturalistic systems "resemble each other in an important historical sense: the bulk of their explanations and practices represent simplified and popularized legacies from the `Great Tradition' medicine of ancient classical civilizations, particularly those of Greece, India, and China" (Foster and Anderson 1978, p. 56). Although Foster and Anderson separate humoral pathology from the Ayurvedic and Chinese systems, all three share the basic paradigm that everything is affected by everything else and that nothing occurs in isolation. Many conditions that are viewed within the Western paradigm as having been caused by an injury and are, therefore, to be treated by surgery are considered by

the Chinese and Ayurvedic systems to be aggravated by disease and thus treatable with medicines and physical therapy.

Unschuld (1985) outlines what he feels are the two paradigms that underlie the "conceptualized systems of therapy" used in the Chinese system, as well as other systems such as those just mentioned, that have tried to explain the occurrence of illness: a) The Paradigm of Cause-and-Effect Relations between Corresponding Phenomena, and b) The Paradigm of Cause-and-Effect Relations between Noncorresponding Phenomena. Anthropologists have spent the past two hundred years publishing interpretations of the functions and symbolic meanings embedded in the practice of homeopathic magic and contact magic (Unschuld's Causation through Magic Correspondence) and how magic is used to explain disease, misfortune as well as what is perceived to be good fortune. Unschuld's Causation through Influence of Natural Phenomena ("food, drinks, air, wind, snow, moisture, head, cold, subtle matter influences, parasites, viruses, bacteria, and others") is a major component in many, if not all, folk models. In contrast, meteorological factors in the Western paradigm have been minimized as a whole, although more and more attention is being given to the treatment of disorders such as Seasonal Affective Disorder (e.g. Allen, Lam, Remick, & Sadovnick 1993) that document the symptoms and family histories of patients who suffer from weather and seasonal patterns.

Chinese-Traditional

The Chinese-Traditional medical model permeates a system of health maintenance, preventive medicine and medical treatment that is custom-designed for each patient as in the Ayurveda system. A patient may be given a prescription for an herbal mixture which is prepared to order in the pharmacy from both fresh and dried

herbs. The prescription may include mineral and animal substances as well. No prescription is given without specifying the exact time of day it is to be taken nor will it be given without a dietary prescription dictating when specifically prepared foods and tonics should be consumed without or just prior to taking the actual "prescription". Circadian rhythms or chronobiological variables are all taken into consideration if the practitioner adheres to the recommendations in the ancient texts. In addition, the patient may also be given acupuncture treatments, massage, a session with a *qigong* healer who will apply therapeutic touch using external *qi*, given meditation exercises and be assigned to a *taijiquan*, *hsing i*, or *qigong* exercise class.

Each treatment is designed to circulate blocked *qi*, the cause of all illness, and to regulate the body's system to become realigned with the universe. *Qi*, a concept that has been translated many ways, often unsuccessfully depending upon the translator's own belief system, is a concept that pre-dates the development of Taoism and which is in essence the energy in the living organisms that Western scientists have tried to document.[6] All living organisms have *qi* and there is a complex belief system as to the kinds of *qi* each element and organism contains, when and how it is acquired and how each can be enhanced.[7]

In addition to *qi*, within the Chinese system, plants, minerals and animal derivatives possess properties of *yin* or *yang* , associated with one of the 5 elements. According to Chinese cosmology, humans are a microcosm of the universe. The universe is literally reflected within the body. The four seas correspond to the brain, air, blood and the water reservoir of the body. The twelve rivers correspond to the twelve pulses. The seven stars in ursa major correspond to the seven orifices in the

head (two ears, two eyes, two nostrils and one mouth). There are 360 degrees in a circle and 360 bones in the body. Heaven is round and so is the head. The earth is square and so is the foot. Heaven consists of the sun, moon, order of stars, rain, wind, thunder and lightening. Man (woman is usually referred to separately) has two eyes, a set of teeth, experiences joy and anger and has a voice and emits sound. The earth consists of mountains, valleys, rocks, stones, trees, shrubs, weeds and grasses. Man has shoulders, armpits, nodes, tuberosities, tendons, muscles, hairs and down.

The four seasons correspond with the arms and legs. There are twelve months and twelve joints. There are a total of nine provinces (or there were in China) and the male body has nine openings (2 ears, 2 eye slits, 2 nostrils, 1 mouth, 1 anus, and 1 urethral). There are seven emotions (joy, anger, sorrow, fear, love, hate, desire) and females mature every seven years (age 7 they lose their baby teeth, age 14 they menstruate (or used to), age 21 they reach maturity, age 28 they are at a peak, age 35 they begin to decline and age 42 they show signs of decay (term used by Wong and Wu)). Males mature every eight years.

There are five elements (metal, wood, water, fire and earth), five afflictions (dumb, deaf, lame, deformed, dwarfed), five sufferings (birth, senility, illness, death, parting), five injuries (over-use of eyes, too much sleep, prolonged sitting, protracted standing, excessive walking), and five kinds of weather (cloudy, clear, windy, rainy, misty, bright).[8] Table 4 lists the five primary elements, which Porkert (1974) notes should actually be translated as the five evolutive phases, constituting stretches of temporal segments "of exactly defined qualities that succeed each other in cyclical order at reference positions defined in space" which typify the qualities of energy embedded in the concepts of wood, fire, earth, metal and water (p. 45).

Imposed upon the above is an additional layer corresponding to the forces of *yin* and *yang* . Wong and Wu (1936) and Porkert (1974) present the *yang* and the *yin* correspondences presented in Table 5. Too much *yin* results in a *yang* disease and vice versa. Excessive *yang* results, therefore, in a fever and excessive *yin* in chills. Each is treated with its opposite. A fever is treated with a *yin* plant. Chills are treated with a *yang* medicine.

Acupuncture is only one technique used within the system of Chinese-Traditional medicine despite the public's misperception that it is the centerpiece of the tradition. As already noted, acupuncture captured the attention of the American press in July 1971 when it was reported that Reston had received acupuncture anesthesia while undergoing an emergency appendectomy. Several articles followed including a series documenting the appraisal of Dr. W. R. Tkach's (Nixon's personal physician) that acupuncture seemed to be a superior method of anesthesia to methods used in the United States. Earlier doctors A. W. Galston and E. W. Signer observed and photographed 4 major operations at Peking Hospital Number 3 for an article in the *New York Times* on May 24, 1971[9] The years 1971 and 1972 are, therefore, points along the timeline that need special attention. According to the January 1, 1994 issue of *Consumer Reports*, the U.S. Food and Drug Administration estimates that 9 to 12 million acupuncture treatments are now performed annually in the United States, mostly to help control pain and to treat addictions. "Nationwide, an estimated 3,000 medical doctors and osteopaths have studied acupuncture and use it in practice - up from 500 a decade ago. In addition, some 7,000 nonphysicians (sic) use acupuncture for a wide array of health problems, sometimes in conjunction with herbs, massage, and other traditional Eastern techniques". The U.S. Department of Education has

Table 4
5 Primary Elements

WOOD	FIRE	EARTH	WATER	METAL
East	South	Center	North	West
Dawn	Midday	Late Afternoon	Midnight	Dusk
Spring	Summer	Late Summer	Winter	Autumn
Potential Activity	Actual Activity	Neutral Indifferentiation	Potential Structivity	Actual Structivity
minor yang	major yang		major yin	minor yin
gallbladder (yang	small intestine (yang)	stomach (yang)	urinary bladder (yang)	large intestine (yang)
liver (yin)	heart (yin)	spleen (yin)	kidney (yin)	lung (yin)

(adapted from Beinfield and Korngold)

Associated with Disorders and Conditions Concerning:

Peripheral Nerve and Circulation	Cardiovascular	Digestion System	Pulmonary and Upper-respiratory Systems	Growth and Development
Equilibrium, Coordination Locomotion	Speech, thinking, emotional expression	Lymphatic circulation	Skin and mucus membrane	Central nervous system (multiple sclerosis, muscular dystrophy, cerebral palsy)
Migraines, inflammation	Sleep patterns	Viscosity	Airborne allergies	Spinal column, bones, teeth, joints
Tension, cramps, muscle spasm, nerves, organs	Psychosis, schizophrenia	Blood, veins, muscles	Fluid and venous circulation	Fluid metabolism

Table 5

Yin and Yang

Yang	Yin
heaven	earth
sun	moon
day	night
heat	cold
life	death
positive	negative
strong	weak
spiritual	material
acid	base
left side	right side
broad	narrow
straight	crooked
energy	inertia
active	passive
red	black
plain	complex
joy	worry
justice	mercy
high	low
good	evil
lucky	unlucky
round	square
long	short
light	heavy
Ahura-Mazda	Ahriman
Osiris	Isis
even	odd
things male	things female
spring, summer	autumn, winter
dryness	moisture
outside surface	inside surface
fire	rain
hours between midnight and noon	hours between noon and midnight

	Yang	Yin
The Body:		
	the back	the abdomen
	skin	interior of body
	hollow organs	solid organs
	heart	spleen
	liver	kidneys
Disease and Illness		
	external diseases	internal diseases
	fever	chills
	affections of the upper body	affections of the lower body
	respiratory disease	circulatory disease
	sudden illness	gradual illness
	paralysis (can't bend	cannot lie on back
The Pulse		
	strong	weak
	bounding	low tension
	large volume	
Drugs		
	stimulants	astringents
	resolvents	purgatives
	expectorants	haematics
	pungent substances	bitter substances
	hot decoctions	cold infusions

approved an accreditation program in acupuncture making students of accredited institutions eligible for Federal tuition aid. As of January 1994 at least 80 private insurers and Medicaid programs in some states covered acupuncture for some conditions.

Wong and Wu (1936) write in their authoritative study of the history of Chinese medicine that

> Acupuncture consists in the introduction of hot or cold needles into the body at certain specific points. In ancient times these needles were made of flint or bone but after the age of iron various kinds of metal- silver, gold, copper, brass or steel-were used. The needles may be either fine, coarse, short or long. The Ling Shu described nine kinds.
>
> The object of the procedure is to puncture the vital points or *Hsüeh Tao* . . . as they are technically called and produce the desired results. 365 such points are described in the *Nei Ching* to correspond with the number of days in a year. These, however, vary with different authors. Thus the *Chien Chin Fang* mentions 650, the *Chia I Ching* 654, *I Ching Hsiao Hsueh* 535, the *Shih Szu Ching Fa Hui* 647 and the *I Tsung Ching Chien* 627 (p. 228).

Wong describes in detail an account of acupuncture treatment and mentions that the needles are often tipped on the outer end after being inserted with a substance that is then heated. In other cases, moxibustion (placing of a glass cup over the needle which is heated with a smoking stick) is applied. A short pictorial history and description of acupuncture and moxibustion was provided in February 1990 by the Chinese government in a series on Chinese medicine in one of the official organs, *China Pictorial*, published as part of the Open Door Policy to publicize Chinese culture and history. David Eisenberg (1985) provides detailed accounts of his own experience trying to learn acupuncture, noting that it is essential that the patient be questioned as to whether or not he or she feels *qi*.

It should be noted that there are numerous varying schools of thought about how acupuncture is to be administered. Japanese acupuncture uses very thin needles

and shallow insertions. Others insert the needle in a rapid jab while others slowly insert each needle, twisting to find just the right point, which is known as feeling "Teh Chi" effect.

One must not forget that the techniques of diagnosis also vary throughout Oriental-Traditional medicine; however, each examines the pulse, the tongue[10], urine, feces, the color of the eyes and skin and in some cases the shapes of faces, astrological charts, numerological charts and the individual's entire life history. The four main techniques, inspection, listening and smelling, inquiry and palpation have a long history in China and are similar to those in Ayurveda (Majumdar 1971), Tibetan medicine (Rinpoche 1973), Arabic/Islamic (Nasr 1976) as well as early twentieth century Western medicine.

The martial arts, popularized more and more in American films and television programming (e.g. *Kung Fu: The Legend Continues; Vanishing Son*), are also part of the medical system as many, if not most, of the highly respected and reputable martial artists over the years have been trained in traditional medicine and were expected to know bone-setting techniques; acupressure and/or acupuncture; herbal and pharmaceutical preparation and administration; and general therapeutic techniques. The complexity of *wushu* is an obstacle which has prevented most outsiders from pursuing research into this aspect of the medical system; however, it should be noted that both the internal and external disciplines entail meditation and moving *qi,* be it for health and defense or for healing (Dunbar 1991). Embedded in legend and myth, and depicted in both Asian and American film, is the supernatural component and the use of external *qi* and/or certain attack moves that can kill opponents. These accounts appear in the martial arts literature and unfortunately, are one of the reasons why some

individuals are drawn to the martial arts (Carradine 1991; *Pa Kua Chang Journal* Interview with Vince Black 1993). What is important here is that this fascination with the occult aspect is in many ways connected to the ever growing public fascination with Chinese traditional medicine as a whole, but there is an equally long history of martial arts in India and Sri Lanka, in some cases also affiliated with the occult.

Ayurveda

The Ayurvedic system has much in common and appears on the surface to be very similar to both the Chinese system and the ancient Greek system. Deepak Chopra, (President of the American Association of Ayurvedic Medicine, Director of the Maharishi Ayurveda Health Center for Stress Management and Behavioral Medicine), writes and lectures on Ayurveda for the general public. Foster and Anderson point out that "Beginning early in the twentieth century, Ayurveda has become more and more important among Indian nationalists as a symbol of the antiquity and greatness of Indian civilization" (p. 61). Foster and Anderson cite the 1920 Indian National Congress proclamation calling for the popularization of Ayurveda. It should be noted that Foster and Anderson stress that "Because of the symbolic role of Ayurveda in India, there is some tendency on the part of authors to make sweeping, undocumented statements" (p. 61). Chopra has been openly criticized in a series of news articles in *JAMA*. Skolnick (1991) details Chopra's financial links to the Maharishi Ayurveda Foundation, his conference and consultation fees and reveals Chopra's financial interests in various holding companies. Skolnick points out that Chopra is notorious for making boasts about attendance at his lectures and for making unsubstantiated claims about the supernatural benefits of Ayurveda. It is with caution, then, that Chopra's best-selling works are cited here, for he often uses

anecdotes of "miraculous" healing and transcendental experiences throughout his books[11]. Chopra does, however, provide more detail on the Ayurvedic medical model than most of the other books that are available.

Chopra details the three *doshas* (variant spellings) - *vata*, *pitta* and *kapha* noting that there are five subdoshas corresponding to each of the body's functions and organs. According to Chopra, Maharishi Ayurveda (as outlined by Maharishi Mahesh Yogi, founder of Transcendental Meditation) looks at the meeting point between mind and body noting that "every time there is an event in the mind, there is a corresponding event in the body". This interconnectedness "is accomplished at a place sandwiched between the mind and the body, where thought turns into matter; it is occupied by three operating principles called *doshas* (1990, p. 25).

Vata is composed of air and space, *Pitta* of fire and water, and *Kapha* of earth and water. Thus, the three abstract fundamental principles are derived from a mixing of pairs of elements, the same five elements as seen in the Chinese system except that *space* is substituted for *metal*. According to Chopra, "to locate the origin of disease as precisely as possible, an Ayurvedic doctor looks beyond the three *doshas* to their *subdoshas*" (Table 6).

Majumdar (1971), in a detailed history of medicine in India, summarizes *Āyurveda* as

> fundamentally a process of restoration and building up, consisting largely of elimination of undesirable ingredients [graphically described by Chopra] and replacing them (and also inherent deficiency) by desirable ingredients from outside. Except in emergencies, medical measures have always the long-term aim of restoring the lost equilibrium of *dosas* and *dhātus*, or of stabilizing any imbalance which may be present in a state of apparent health. All drugs and medicinal measures, as also surgery, are employed to these ends; so also are diet and conduct recommended to the patient. In pursuance of these aims, *Ayurveda* makes no distinction between hygienic measures, preventive

> medication and therapeutics, or between items of diet and oral medicine.
> Food, drugs, therapeutical and surgical measures, daily routines in health and medical measures in sickness - all are, therefore oriented to the paramount need of creating an equilibrium of the *gunas*, *dosas*, *dhātus* and *malas*, individually and jointly. Only then it is possible to uproot the causes of disease. These ideas apply equally to the mind and the body; for in the case of the mind the equilibrium can be similarly upset by an imbalance of the *gunas* beyond normal levels. Mental treatment, therefore, requires psychic catharsis and spiritual rebuilding (pp. 248-249).

Majumdar points that there are several schools of *Āyurveda* but they all share "certain common denominators" in the treatment of pathological conditions: *samśodhana* (cleansing and evacuative processes), *samśamana* (tranquilization and rectification of humours and *dhātus*), *āhāra* (proper drugs taken orally, and diet) and *ācāra* (correct conduct and medical regime). Echoing De Vries's inclusion of spirituality, Majumdar states that the patient under the care of an Ayurvedic practitioner is purified, tranquilized, and then "fed with proper ideas and trained to think in proper lines" using "prayers, propitiation, spiritual guidance, exorcism of evil influences, etc." as well as instruction on public hygiene graphically outlining all aspects of bodily function.

The question that needs to be asked when contrasting these two vastly different world views is: what set of circumstances prompted Western scientifically trained researchers to test the medicinal properties of non-Western materia medica? Since non-Western materia medica contain plants, minerals and animals that are classified according to their homeopathic characteristics and these elements are, therefore, assumed to have medicinal properties because of these characteristics, what prompted Western trained researchers to set aside their dismissal of claims made by ancient texts and oral traditions that an element works because of its homeopathic elements and to test the claims that the elements have medicinal properties?

Table 6

SUBDOSHA - LOCATION	IMBALANCE
Prana Vata - brain, head, and chest	worry, anxiety, overactive mind, insomnia, neurological disorders, hiccups, asthma, respiratory complaints, tension headaches
Udana Vata - throat and lungs	speech defects, dry coughs, sore throats, tonsillitis, earaches, generalized fatigue
Samana Vata - stomach and intestines	too slow or too fast digestion, gas, diarrhea, nervous stomach, inadequate assimilation of nutrients, emaciated tissue formation
Apana Vata - colon and lower abdomen	constipation, diarrhea, gas. intestinal cramps, colitis, genito-urinary disorders, menstrual disorders, swollen prostate, various sexual dysfunctions, lower back pain, muscle spasm
Vyana Vata - throughout the body via the nervous system, skin, and stress-related circulatory system	high blood pressure. poor circulation irregular heart rhythm, nervous disorders
Pachaka Pitta - stomach & small intestine	heartburn, acid stomach, ulcers, irregular digestion
Ranjaka Pitta - in the red blood cells,	jaundice, anemia, various blood disorders liver, spleen, skin inflammations, anger and hostility
Sadhaka Pitta - heart	heart disease, memory loss, emotional disturbance, indecisiveness
Alochaka Pitta - eyes	bloodshot eyes, vision problems, eye diseases of all kinds
Bhrajaka Pitta - skin	rashes, acne, boils, skin cancer, skin disorders of all kinds
Kledaka Kapha - stomach	impaired digestion
Avalambaka Kapha - chest, lungs, lower back	respiratory problems of all types lethargy, lower back pain
Bhodaka Kapha - tongue	impairment of taste buds and salivary glands
Tarpaka Kapha - sinus cavities, head	sinus congestion, hay fever, sinus spinal fluid headache, impaired sense of smell general dullness of the senses
Shleshaka Kapha - joints	loose, watery or painful joints, joint disease

In the second edition of a 1933 text on Indian materia medica, Indian drug researchers write that "History shows that many of" India's

> important pharmacopoeial drugs were known and were also used in some form or other possibly long before they were introduced into the Western medicine and before their actions were investigated on scientific lines. On the other hand, there are sure to be others of little therapeutic value that are given merely because they are mentioned in some old manuscripts, and no one has taken the trouble to confirm the truth of these statements. Attempts must be made to separate the good ones from the useless ones and for this a systematic investigation of these drugs must be undertaken. Medicine is a progressive science; in every department an attempt is being made to replace empiricism by rationalism and nowhere is this more evident than in the science of pharmacology and therapeutics (Chopra, R. N., Chopra, I. C., Handa, K. L., & Kapur, L. D. 1982 [reprint of 1958], p. 6).

In 1979 UNESCO's general interest publication, *Courier*, devoted an entire issue to non-Western medicines. Attisso (1979) reports that statistics at that time from the International Centre for Commerce showed that "medicinal plants have lost none of their importance despite constantly increasing use of chemotherapy, the treatment of disease by chemical substances" (p. 7). As of 1979 "The proportions of medicinal plants used in the preparation of pharmaceutical products in the world . . . is about one-third that of synthetic chemical substances" (Attisso, 1979 p. 7). According to Pelt (1979) there was a "powerful demand for research into `softer', less aggressive therapeutic techniques, which will subject the human system to less strain, accompanied by a steep worldwide increase in the production and consumption of medicinal plants" (p. 12).

One can conclude from these comments that there are both economic as well as medical reasons motivating researchers to pursue a quest to discover, uncover, and test the world's diverse and rapidly disappearing *materia medicae.* Both Attisso and Pelt point out that in 1979 the World Health Organization was actively sponsoring research

into traditional medicine while encouraging all its Member States to produce an up-to-date inventory of their therapeutic resources. This shift away from the belief that modern medicine had advanced to a stage where it could dispense with herbal remedies is itself an indicator that change in biomedicine's approach to pharmacological research has occurred.

SECTION IV: STAGES OF CHANGE IN SCIENCE

"THE BLACKEST DEFECT in the history of science, the cause of dullest despair for the historian, lies in the virtual absence of any general historical sense of the way science has been working for the last hundred years. For the scientist it is more than anything else that makes him feel that this subject is an irrelevant sham and at best makes him undertake to produce a chronicle rather than a history, a mere sequence of who did what and when and how". - Derek de Solla Price, 1961, Science Since Babylon.

Research Stages

A search of the literature from 1933 to the present to determine whether researchers acted upon the recommendations made by Chopra et al. would yield results too extensive for a pilot study. A narrower time frame is thus necessary. Based on reviews of the literature presented by Koenig (1982) and Johnson (1983), whose work will be discussed shortly, it is proposed that research of sufficient scientific value to be included in *Index Medicus* would follow an evolutionary sequence from curiosity to clinical trials. Research should progress through the following stages:

Stage 1: Descriptions of the uses of medicines (plants, etc.)

Stage 2: Descriptions of the beliefs about medicines

Stage 3: Testing the claims of medicinal properties or therapies

Stage 4: Testing the effectiveness of various dosages or therapies on specific illnesses

Stage 1 research includes ethnobotanical field studies, ethnographic case studies, case studies of historical documents and archival research, translations of documents found at archaeological sites and stored in museums as well as studies of the history of pharmacies. Stage 2 research, which may appear in conjunction with stage 1 studies, includes ethnographic case studies on the role of medicine within different communities, the role of shamans, healers and midwives as well as studies of faith healing. Stage 3 research focuses on the chemical analysis of substances that are

reported to have medicinal properties as well as substances found in threatened ecological niches such as rainforests and areas designated for development.

Stage 4 research is classified as clinical trials and includes the testing of dosages of separate substances and in combination with others on the treatment of specific conditions. These studies test dosages on animals and humans. It is this stage of research that appears before a drug can be patented if found to be safe and effective.

Bibliometric Studies of the Pharmaceutical Industry

Koenig (1982) states that although there were bibliometric studies of pharmaceutical research prior to 1982, his was the first to focus on the study of research published by pharmaceutical companies compared with academic research that coupled research with performance measures. Koenig outlines the sequence of funding and testing that must be completed before a drug can be patented. Koenig documents that "the lag between the reporting of research undertaken and drugs emanating from that research is certainly less than that between the original research and the appearance of the drug" (p. 42). Although Koenig states that there is a dispute over the exact time lag between research undertaken and NDA approval, the period quoted is around ten years. It is necessary, therefore, to study the progress of pharmaceutical research over at least a 20 year time period, allowing 5 years before the inception of a project and 5 years after the conclusion, to capture all of the significant publications. Koenig's work is also important because he documents that "clinical articles consistently correlate more highly with drug output than do other subject bibliometric variables" (i.e. citation patterns) (p. 91). Clinical trials will, therefore, be isolated from the data set as an indicator of progress in the field.

Johnson (1983) presents an overview of the study of pharmaceutical research citing findings by Schwartzman (1976) and Litchfield (1961). Johnson quotes Schwartzman (1976) as writing that it is necessary to "emphasize that animal tests occur early in the pharmaceutical innovation process" and that clinical trials testing drugs on the dog were found to be more consistent in the prediction of the effect on humans than studies conducted using the rat (p. 16). Johnson also documents research that found that bibliometrics can be used to predict the clinical fate of developing drugs. Based on her study of the literature of the seventies on pulmonary and cardiovascular disease, Johnson concludes that

> In this study, it was also found that for a new drug, the beginning of the literature cycle consists of publications directed toward preclinical studies in animals. As the drug is used, the publications contain information in relation to studies in man. The clinical study becomes the predominant format of communications. As the drug becomes of age the case report and clinical trial study appear to be the formats of communications in acknowledging therapeutic efficacy. The occurrence of adverse reactions, if any, are also communicated in both formats...the reporting of a serious reaction is most often communicated in the case study literature. Toward the end of the cycle, when publications are in the decline stage, the format changes to comments, mentions in the reviews and occasional use in preclinical and clinical studies (p. 264-5).

Johnson confirms Narin's findings that there is usually a core group of journals that is identified for each drug. Johnson states that

> A core of twenty journals as identified in this study, including specialty titles, provide moderate to excellent coverage for any drug product or topic, at any point in time. A clinician or scientist only has to identify the drug class or individual product, and then monitor those journals associated with it (p. 270).

Finally, Johnson lays the framework for outlining the history of interest in research into a particular drug. The first stage is exposure, when a publication appears on a subject or drug. The next is interest, when "several publications are generated in reply to the first publication or subsequent publications". The third is supportive,

when "publications appear which discuss various and new applications concerning the subject or drug". The fourth is the period of maintenance, when "publications contain information on the acceptance of the subject or drug in the realm of peer review (standard). At this point, new subjects or drugs may be compared to the standard". The fifth stage Johnson labels as decreased interest, when "publication interest is directed toward newer subjects or drugs that challenge the standard". The final stage is decline, when "low to zero publications on subject or drug, mentions or comments prevail" (p. 275).

This outline of the evolution of a research interest documented by using non-Western pharmaceutical research as a subset within the overall data set will serve as a guide to developing a model of growth of the literature within non-Western pharmacology as well as non-Western medicine as a whole. Johnson and Koenig focused specifically on subsets of data. By taking a wide time frame it is predicted that their findings will be confirmed for several different time periods. The model for this study is based on the assumption that research into a vastly different scientific paradigm will progress very gradually over time, beginning with those who come into contact with the "new" paradigm and become curious about it.

As more and more studies are conducted testing claims made by Chinese, Ayurvedic, Islamic, shamanistic and non-biomedically trained health care providers, several basic tenets of the non-Western medical model emerge in contrast to Western scientifically based biomedical model. It is proposed that Stage 5 research revolves around the philosophical issues posed by integrating components of contrasting models. Papers and conferences on the convergence of theories may or may not be included in this stage in building a universally acceptable medical model.

SECTION V: SCIENTIFIC PARADIGM CHANGE

Scientific Paradigm Change

> "There is a cyclic nature to human activities. Progress is not unidirectional. Oat bran is `in' today, but you know it will be something else tomorrow. Fashions and fads come in medicine as they do in our music and politics. The restlessness, adventurism, and enthusiasm of youth always want to change things. Faculties are always tinkering with curricula, but an observer with a long view often notes similarities of the new to the old" - James H. Foster, M.D., 1989.

Scientific paradigms have been studied by Kuhn, Price, Crane, Laudan, Lakatos and many others using bibliometric data as well as techniques and analysis from the history of and sociology of science. Most studies of paradigm change have focused on the shift from one grand theory or central postulate to another (e.g. continental drift and plate tectonics, the switch from classical mechanics to quantum mechanics physics, acceptance of the existence of black holes, adsorption of gases). Shapere (1980) writes

> The distinction between paradigms and different articulations of a paradigm, and between scientific revolutions and normal science, is at best a matter of degree, as is commitment to a paradigm: expression of explicit discontent, proliferation of competing articulations, debate over fundamentals are all more or less present throughout the development of science: and there are always guiding elements which are more or less common, even among what are classified as different `traditions' (p. 32).

A clear division can be seen in the works that document a change from a paradigm that states that XYZ exists to the opposing view that XYZ does not exist but these examples are often only recognized in retrospect. Basically such a paradigm change can be seen as having taken place in the field of medicine during the nineteenth century. What does not exist, however, is a body of literature on medical paradigms that underlies the fields of clinical medicine, pharmacology, psychology and the changes in these paradigms.

Review of the Literature

One article that does discuss paradigm change in clinical medicine that is applicable to this study states that there has been a major shift in the teaching of clinical practice. The new paradigm, evidence-based medicine,

> de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision making and stresses the examination of evidence from clinical research. Evidence-based medicine requires new skills of the physician, including efficient literature searching and the application of formal rules of evidence evaluating the clinical literature (Evidence-Based Medicine Working Group 1992, p. 2420).

The Evidence-Based Medicine Working Group outlines the former paradigm based on four guiding assumptions about the knowledge required to guide clinical practitioners. The authors state that according to the old paradigm clinicians have four options for "sorting out clinical problems they face". Clinicians could "reflect on their own clinical experience, reflect on the underlying biology, go to a textbook, or ask a local expert" (Evidence-Based Working Group, p. 2421). Clinicians might also read "the introduction and discussion section of a paper".

Citing Light's article in *Journal of Health and Social Behavior*, the authors make the point that this paradigm "puts a high value on traditional scientific authority and adherence to standard approaches, and answers are frequently sought from direct contact with local experts or references to the writings of international experts" (p. 2421). The new paradigm within clinical practice stresses systematic observation and the recording of such observations, the acknowledgement that "the study and understanding of basic mechanisms of disease are necessary but insufficient guides for clinical practice", that the "understanding of certain rules of evidence is necessary to correctly interpret literature on causation, prognosis, diagnostic tests, and treatment

strategy" and that clinicians should regularly consult the original literature accepting and living with uncertainty.

Although the former paradigm stressed the need for sensitivity to patients' emotional needs and understanding patients' suffering and how "suffering can be ameliorated by the caring and compassionate physician", the new paradigm stresses the use of behavioral science techniques "to determine what patients are really looking for from their physicians and how physician and patient behavior affects the outcome of care" (p. 2422). The authors discuss several cases as well as the use of MEDLINE and Grateful Med but do not touch on alternative medicine nor on the field of non-Western medicine despite the similarities in guiding assumptions on how medicine should be practiced.

Although these articles do not directly address the issue of a global theory of modern medicine and whether the underlying guiding assumptions are changing, it is important to make note that the field of medicine is not always classified as a science. It is presumed that it is driven by a set of guiding assumptions on how the body works and how the body is to be healed. Historians of the field of medicine and pharmacology (e.g. Cowen & Helfand, 1990; Kremers & Urdang, 1976) all agree that modern medicine began during the nineteenth century with the outlawing of medical quackery, defined as all forms of treatment considered unscientific. This is an important paradigm shift and set the stage for developing a set of rules for how patients should be diagnosed, how laboratory tests of drugs should be conducted and how surgery was to be performed, i.e. standards of sanitation, et cetera. What is important to emphasize is that a distinction was made between what was considered to be scientific and what was considered to be "quackery", based on scientific

experimentation and scientific observation.

Laudan, Donovan, Laudan, Barker, Brown, Leplin, Thagard, and Wykstra (1986), in an article in a special issue of *Synthese* on testing theories of scientific change, compile a list of 238 points of philosophical agreement and disagreement amongst theorists studying the history of science. Most of the theoretical statements pertain more to the hard sciences than to medical science; however, several statements can be extracted which are applicable to a study of paradigm change within conventional medicine toward the acceptance of some forms of non-Western medicine. Laudan, et al. state that chief among the areas of agreement are sixteen basic claims. Number ten and number thirteen on Laudan, et al.'s list are probably applicable to the field of medicine. These claims are referred to here as hypotheses are:

Hypothesis 1:

> "The coexistence of rival sets of guiding assumptions in a science is the rule rather than the exception. Debate about rival sets of assumptions does not alternate with periods of universal assent to one set, but occurs constantly" (Laudan, et al. 1986, p. 155).

Hypothesis 2:

> "A later set of guiding assumptions seldom accommodates all the explanatory successes of its predecessors. There are losses as well as gains in the replacement process" (ibid., p. 155).

It is predicted that there will be constant debate about the value of medical treatment classified as non-Western as well as debate about the medicinal properties of non-Western drugs, substances, dietary prescriptions and compounds. There should be evidence of this debate in both the public arena, i.e. general press, and within the

medical literature. Although reliance on keyword searches of indexed literature along with electronic versions of articles increases the risk of sample bias and threatens the internal validity of a study, for the purpose of documenting public debate, the sample of specific comments about public dissatisfaction with modern medicine (Table 15) is considered sufficient evidence for testing Hypothesis 1 (H1). Thus,

Hypothesis 3:

> Statements expressing dissatisfaction with conventional medicine will begin to appear as the number of articles on non-Western medicine escalates.

Areas of disagreement amongst theorists are also presented by Laudan, et al. and three of these assumptions are ones that are pertinent to this study.

Hypothesis 4:

> "Whether a shift in guiding assumptions is both unreasoned and externally caused -- perhaps the result of propaganda or a gestalt switch -- or whether scientists are guided entirely by scientifically relevant reasons when they change allegiance" (ibid., p. 157).

The claim that a shift in guiding assumptions is perhaps the result of propaganda is one of the prevailing theories behind this study. Propaganda, in this sense, is used to refer to missionary activities, for example, the establishment of Ayurvedic medical centers, Taoist healing retreats, Buddhist meditation centers, and the publicizing of ethnic, national and regional movements (i.e. Native American Indian Movement; rise of Asian nationalism; Maori empowerment) Most scholars (e.g. Michael Adas, historian of science, Rutgers University) have focused on the impact of Western medicine, science and technology on non-Western communities. In this study, on the other hand, it is assumed that the spread of information about non-

Western alternative therapies has raised public awareness about other medical models in general as the travel increases through the process of globalization of economic markets. Thus, it is assumed that the initial public dissatisfaction amongst immigrant and indigenous populations with modern medicine has spread throughout the general population and is a causal factor in motivating medical researchers to investigate claims made by non-Western medical systems and alternative medicine as a whole as patients increasingly demand access to such treatment.

Hypothesis 5:

Specific external factors occur before changes in research direction and publication output on the issues raised surrounding the external event or events.

Hypothesis 6:

Travelers' accounts, foreign exchange or any form of exchange where personnel travel to other locales, are catalysts for change in that eye witness accounts of different methods, techniques, tools, and/or approaches to solving problems will be used to question how such problems are solved within the current prevailing paradigm.

Hypothesis 7:

Proponents of one set of guiding assumptions cannot communicate fully with adherents to an opposing set of guiding assumptions.

The disagreement over whether there is cooperation between scientists who are working from two opposing world views or not is of major interest to this study and it is predicted that the bibliometric methodology used to uncover invisible colleges will yield evidence documenting, in this case, that language and culture are impediments to communication. For example, primary literature on traditional Chinese medicine,

including the study of medicinal herbs and acupuncture, is written in Chinese, Japanese, Korean, as well as Southeast Asian languages from different time periods often requiring specialized linguistic skills to translate such materials into modern Asian languages. Non-native speakers are confronted with the obstacle of learning how to translate ancient, medieval and modern texts. Kanwan (1989) details a list of obstacles facing translators and scholars who must rely on secondary literature providing specific examples illustrating just how such errors affect meaning and interpretation. Omissions, disarrangements and miswritten characters, wrong annotations, misunderstanding the true meaning of a character, phrase or certain expression in ancient texts and the perpetuation of these interpretations, wrong punctuation due to one's lack of medical knowledge or lack of grammatical knowledge or lack of historical and literary knowledge and, of course, the inability of the translator to find a corresponding concept in the target language are all major errors found by Kanwan. Rochat de la Vallee (1989) provides further documentation of the difficulties faced in translating classic ancient medical texts while Zimmerman (1989) and Kahle (1989) discuss the problems encountered in translating Sanskrit and Arabic. Thus, in the early stages, there will be little communication between researchers who hold rival sets of guiding assumptions. This will be tested by searching for passages in the texts that indicate that treatments were tested but no attempt was made to test the theories taken from the rival paradigm.

Another theoretical assumption summarized by Laudan, et al. that is applicable to this study states that

Hypothesis 8:

The "acceptability of a set of guiding assumptions is judged largely on the

> basis of its ability to solve problems outside the domain of its initial success" (ibid., p. 164).

It is assumed that one's initial success with acupuncture treatments or with a dose of Chinese ginseng is not the only reason for re-evaluating one's position on the value of non-Western medicine as a whole. It is assumed instead that the insight into how the body may or may not heal itself, in other words, the added benefit of being able to solve other medical mysteries by applying non-Western theories will motivate the research community into acceptance of at least some of the rival theories.

Hypothesis 9:

> The number of clinical trials and journal articles about non-Western medicine will increase as evidence of successful treatments increases.

Furthermore, Laudan et al. summarize that:

Hypothesis 10:

> Competing sets of guiding assumptions "are often used simultaneously in scientific research" (ibid., p. 166).

Hypothesis 11:

> New sets of guiding assumptions "are suggested long before a good rationale has been provided for them" (ibid., p. 167).

This will also be tested by documenting that although Western physicians cannot explain how or why non-Western medical treatments are often successful, they are willing to employ those techniques and pharmacological substances that they feel are effective. Therefore,

Hypothesis 12:

> A series of journal articles discussing the effectiveness and or medicinal

properties of specific non-Western treatments appear in Western journals for several years before clinical trials are published.

Further claims that can be studied here is that:

Hypothesis 13:

New sets of guiding assumptions "are suggested but ignored long before the older guiding assumptions are perceived to be in difficulty" (ibid., p. 167).

Hypothesis 14:

New sets of guiding assumptions are "developed, accepted and exploited before apparently decisive arguments for them have been advanced" (ibid., p. 167).

These two claims can be tested by examining the graphs of the growth of the literature and comparing statements made by authors before and after there are any indications of changes in public sentiment operationalized here in terms of statistical data on patient use of alternative non-Western treatment and public hearings or media reports citing public demand for changes in the system.

Hypothesis 15:

Journals published in countries outside of Europe and the United States publish articles on non-Western medicine for several years before such articles are published in the West.

Hypothesis 16:

Clinical trials appear before journal articles outlining the components of a comprehensive universal medical model encompassing postulates from the biomedical as well as the socio-psycho-cultural-metaphysical components of the various non-Western medical models are published.

This last point is reflected in the claim that:

Hypothesis 17:

New sets of guiding assumptions "are thought worthy of investigation largely because of factors external to science" (ibid., pp. 167-168).

Although no causal claims will be made, it is predicted that a correlational claim can be made that a large percentage of the number of authors who have been motivated to test claims about non-Western medicine have been motivated to do so by external factors such as the health care debate, anecdotal claims made by patients, friends, neighbors and colleagues and general curiosity about other cultures. Although no specific attempt will be made to seek out interview data at this time, data to support this claim will be taken from the published literature cited and content analysis of abstracts and texts of identified articles from the data set.

Hypothesis 18:

Content analysis of abstracts and interviews will reveal references to specific external events that motivated researchers to undertake research outside the prevailing paradigm.

Two other claims about scientific change that are applicable are that:

Hypothesis 19:

Proponents of different sets of guiding assumptions "think that the books and articles of the rival set are not fit for scientific study" (ibid., p. 169).

Hypothesis 20:

Proponents of different sets of guiding assumptions "view the world through different conceptual spectacles" (ibid., p. 169).

Presumably there will be passages that refer to textbooks on the history of medicine and pharmacology that state that non-Western medicine has been considered unworthy

of attention and that few original texts have been translated for wide readership because of the belief that most of non-Western medicine is based on superstition and unscientific beliefs. Unlike the field of alternative medicine as a whole, the study of non-Western medicine by Westerners is impeded by both language and cultural barriers. In addition, Ayurveda, Chinese-Traditional, Tibetan medicine, as well as shamanistic healing are intricately connected with their respective cosmological belief systems. It is obvious that adherents to these systems view the world through radically different, in some cases diametrically opposed perspectives ,compared with adherents to the atheistic allopathic system. It can almost be argued, therefore, that these two hypotheses can be supported *ipso facto*.

Hypothesis 21:

Few if any book reviews appear in a data set on an area of medicine outside the dominant paradigm.

Hypothesis 22:

The number of book review articles about non-Western medicine indexed will decrease as the number of clinical trials and research articles increases.

Hypothesis 23:

Statements about government or social policy actively discouraging non-Western medicine appear throughout the literature on medicine wherever the biomedical model has been made the dominant paradigm.

Laudan, et al. also state that

Hypothesis 24:

"Scientists usually switch from one set of guiding assumptions to a new set within a decade or so of the recognition of acute empirical difficulties with the

older set" (ibid., p. 169).

This claim will be tested by examining the shift in research focus from 1966 to the present documenting the change in the number of research articles, clinical trials and shifts from one drug research stage to the next. Simply stated,

Hypothesis 25:

There is only a small number of articles on non-Western medicine before a shift in paradigms, marked by a period of growth for 10 years.[12]

The next claim that

Hypothesis 26:

"During a change in guiding assumptions a few scientists accept a new set of guiding assumptions which foster rapid change, but resistance intensifies when change appears imminent" and that "four successive stages can be distinguished: the formulation of the new set of guiding assumptions by a small group; the commitment to those assumptions; the dissemination to the wider scientific world; and the conversion of a significant number of scientists" (ibid., p. 170)

will be tested by identifying passages that contain comments about the author(s) perception of the status of research at the time of publication.

Hypothesis 27:

The core group of authors with multiple publications accounts for the largest percentage of total publications.

This hypothesis will be tested using the bibliometric data.

The next claim that the

Hypothesis 28:

Appraisal of a theory "is sometimes favorable even when scientists do not fully

believe the theory, specifically when the theory shows a high rate of solving problems" (ibid., p. 173)

will be supported by passages containing statements that the author or authors have tested and possibly adopted a new therapy but have not accepted the theory from which it is derived. This last point is interconnected with the claim that the

Hypothesis 29:

Appraisal of a theory "depends on certain tests regarded as `crucial' because their outcome permits a clear choice between contending theories" (ibid., p. 173).

These tests for the purpose of this study will be defined as chemical analysis of substances and clinical trials. If there is an increase in the number of chemical analyses followed by an increase in the number of clinical trials it is assumed, based on the work of Koenig and Johnson, that the success rate of one set of studies justifies further investment into further studies, thus leading to a clear choice of specific dosages and treatments for specific illnesses.

Hypothesis 30:

Articles reporting on the medicinal and chemical properties of substances appear before clinical trials using those substances.

The claim that

Hypothesis 31:

In the early stages of science "results are reported in books that develop the subject from fundamentals and are addressed to both specialists and a larger public" (p. 177)

will be tested by examining the number of book reviews listed in the indexed literature

over time. Evidence has already been presented to indicate that a number of television programs have been aired recently on the subject of alternative medicine and these data will be used to propose future research into a correlation between medical literature and the reports in the popular media. The success of the Moyers program is one indicator that this claim can be easily tested.

Hypothesis 32:

Television programs, magazine articles and books about non-Western medicine directed toward the general public appear in increasing numbers along with materials directed toward the more educated consumer in times of a scientific paradigm shift.

Hypothesis 33:

Early work on non-Western medicine will be descriptive at first and progress through a series of stages: 1): Descriptions of the uses of medicines (plants, etc.), 2) Descriptions of the beliefs about medicines, 3) Testing the claims of medicinal properties, and 4) Testing the effectiveness of various dosages or therapies on specific illnesses.

Hypothesis 34:

Abstracts and articles in the early stages of change will contain statements explaining the differences between non-Western and Western models which will disappear (what Merton (1965) labels the process of obliteration) after ten years or so.

In addition to the claims synthesized by Laudan et al., the authors list a series of claims made by each of the major theorists. Thus, Kuhn's claim about research articles is one of the main reasons why data on publication type will be collected.[13]

Hypothesis 35:

"During, and *only during*, periods of agreement about guiding assumptions the primary unit of publication is the research article" (ibid., p. 165)

It is assumed that the majority of articles prior to a paradigm change will be classified as historical articles and/or review articles. For the purpose of this study, a research article will be defined as those classified by *Index Medicus* as a clinical trial or journal article.

Hypothesis 36:

The majority of articles prior to a paradigm shift are historical reviews and review articles.

Laudan et al. add that Kuhn pointed out that

Hypothesis 37:

"In a fully developed science research results are reported to scientific societies, published in specialized journals, and codified in textbooks" (ibid., p. 177).

This claim requires a design that is outside the scope of this study; however, data will be collected on the types of journals, their refereed status and research society affiliation in order to at least test part of the theory.

Similarly, it is not possible within the confines of this study to fully test whether

Hypothesis 38:

"Science textbooks, popularizations and philosophical discussions do not accurately report how changes in guiding assumptions came about. Specifically, they present only some of the relevant evidence as if it were all the evidence" (ibid., p. 188).

Nonetheless, examples from television documentaries, popular general interest magazines and business literature will be provided that specifically discuss change. These examples will serve as a preliminary test of this claim.

Laudan et al. also include the claim that

Hypothesis 39:

> "In an undeveloped field, advocates of one set of guiding assumptions criticize rivals, not by pointing to failed predictions, but by attacking their general plausibility" (ibid., p. 193).

According to De Mey, William James in the preface to *Pragmatism* published in 1907 made a "bantering distinction" between the first stage toward the acceptance of new ideas when "opponents will declare the new ideas ridiculous or meaningless" and the second stage when new ideas are merely trivialized (De Mey, pp. xii-xiii).[14] Thus, the theoretical claim can be made that proponents of new approaches to the study of a scientific field, or advocates of new ways of looking at solving a problem, in Laudan's et al. words, proponents of rival sets of assumptions, will be met with ridicule, blacklisting, censorship and professional difficulties in the earliest stages of paradigm change. As more adherents to the new paradigm openly enter the discussion, their work will be trivialized and editors will refuse to publish it.

Hypothesis 40:

> Statements containing words or phrases labeling rival sets of assumptions as nonsense, unscientific, etc. along with statements claiming that individuals or groups proposing research using the rival set of assumptions are quacks and their work is unworthy of scientific recognition will appear throughout the period of paradigm change.

Another claim made by Kuhn that will be partially tested is that

Hypothesis 41:

> "The transition to a developed science will be accompanied by the formation of specialized journals, societies and academic curricula" (ibid., p. 182).

Data on the creation of specialized and their research society affiliations will provide preliminary results that will be used to support the claim that non-Western medicine will evolve from a topic of interest to historians of medicine and medical anthropologists into a distinct discipline on its way towards transforming conventional medicine as a whole. Kuhn does not distinguish between the construct of a "developed science" and the construct of a distinct discipline or recognized subdiscipline; however, for the purpose of this study, non-Western medicine is perceived to be (at the outset in 1966) a topic rather than a "field of interest" or a "speciality".

As previously stated, sociologists of science (i.e. Allen, 1969; Paisley, 1980; Price 1984) often make the distinction between the different fields of science compared to engineering, medicine and the social sciences. Few, if any, distinguish between scientific communication and what could be broadly referred to as scholarly communication, preferring to conduct research on specific aspects, i.e. information use, communication within laboratories. In a volume edited by Rachel Laudan (1984), Price, Laudan, Constant, and others stress that there are major differences between the sciences and technology. Although they do not specifically discuss medicine, many of the factors found in technology as a field, i.e. funding, expectations of utilitarian outcomes, et cetera, are similar to those surrounding the field of medicine. It is necessary to stress, therefore, that within the confines of this study, previously

developed theoretical assumptions about science were selected as applicable to the field of medicine defining medicine as a "science" in the sense that medical research is considered a science separate from the practice of medicine which might be considered an "art".

The last claim taken from Lakatos has already been demonstrated within the chapter on medical models.

Hypothesis 42:

"In transitions from one set of guiding assumptions to another, the successor generally will not be simpler than its predecessor" (Laudan et al., p. 202)

The Western model is both reductionistic in its view of the physician-patient relationship and its system of treating disease as a whole. The non-Western model is exceedingly complex as is the holistic approach taken by practitioners of all forms of alternative medicine. If modern medicine is moving toward an integration of any of the aspects of non-Western medicine, it will naturally become more complex in the process.

Summary

Thus, up to this point a total of 42 hypotheses have been proposed that will be tested using both bibliometric data and content analysis of medical research articles published in peer reviewed Western journals. It is assumed that for a paradigm change to take place in biomedicine, issues must be brought to the attention of the majority of practitioners and researchers who adhere to the biomedical model. Physicians and researchers from China, India and Tibet are more likely to be familiar with their own cultural backgrounds even if they ascribe to the biomedical model and reject their own medical traditions as superstition. It is highly improbable that

scientists living and working in these cultures have never come into contact with their own culture's medical traditions, in contrast to the majority of Westerners who must seek out such traditions in order to learn about them. Japan and Korea might be exceptions to the rule if one only focuses on contact with the therapies; however, Kampo (Japanese traditional medicine) and Korean shamanism are only products of their respective cultures and no one can ignore the impact his or her own culture makes on his or her life. Therefore, the distinction between Western and non-Western is assumed to be valid and that it reasonable to assume that indicators of a paradigm change must be evident in Western journals, specifically prestigious journals, for change to take place in the biomedical model. Much is known about the impact of Western medical training, medical technology, and surgical techniques on non-Western medical systems but little if known about the impact of non-Western medical paradigms on biomedicine. There is more than enough evidence that many of the therapies have made inroads into Western society and that there is a campaign to promote holistic medicine but the issue has not been framed in terms of scientific paradigms.

SECTION VI: THEORETICAL MODEL

Theoretical Model

> "We can no longer treat the actual world as simple. We have found in physics, chemistry, ecology, linguistics and psychology that diversity, interaction, and open systems are the nature of things. The world is composed of diverse things, all of which interact; and it is in principle impossible to separate a thing from its interactive environment." - Schwartz and Ogilvy (1979).

The underlying theoretical models depicted in Visual Model 1 and Visual Model 2 illustrate the chronology of external and internal factors (Tables 7 and 8) that frame the patterns of growth of the literature as illustrated in Figure 1 the types of cross-cultural collaborations identified, the types of issues outlined through content analysis of televised and published interviews, and the changes in research direction outlined through content analysis of the research articles and abstracts. The model depicts the links between the methodologies of bibliometrics from information science, content analysis of research articles from the field of sociology of science, and content analysis of media reports as used in media studies and communication science. An interdisciplinary approach is thus taken in an attempt to test theoretical assumptions/hypotheses about cross-cultural scientific communication as it pertains to the study of converging paradigms.

This theoretical model is based on the functionalist/structuralist Mertonian approach to the study of the sociology of science. It should be noted, however, that there are much broader issues surrounding the study of science itself. Stephan Fuchs, a sociologist at the University of Virginia, notes that the Mertonian approach makes the distinction between external and internal factors and suggests that

> . . . in worshipping science as a sacred object, philosophy worships our most fundamental cultural practices. The binary oppositions philosophy establishes between `internal' versus `external' and `rational' versus `empirical' aspects of

> science correspond to the fundamentally dualistic structure of `occidental' culture (1992, p. 37).

It should be noted that what most sociologists of science have termed external versus internal factors is slightly different than the way the terms are used in this model.[15] The mind set or world view from which this model is built, however, is eloquently described further by Fuchs as he continues the above passage.

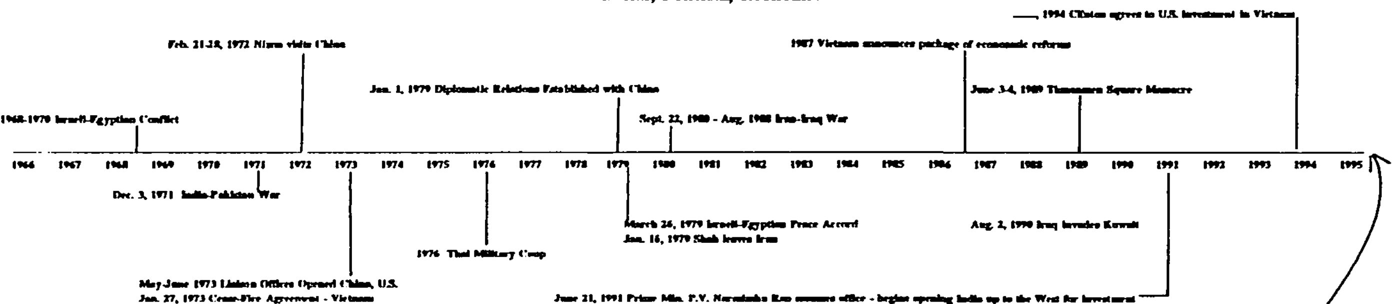
> We draw deep ontological and epistemological distinctions between mind and body, spiritual and material essences, body and soul, subject and object, agency and behavior, intentions and causes, culture and nature, explanation and understanding. In each of these contrast pairs, two different types of forces are postulated: forces that are distinctly `rational,' `human,' or even `spiritual' (such as body, causes, and behavior). In fact, these binary oppositions express the ways in which occidental humans separate themselves as rational beings from that which is nonhuman and nonrational. Our cosmology revolves around the notion that the universe consists of two radically different types of things. These distinctions do not just concern the esoteric discourse of professional philosophers, but underlie our most basic cultural practices. They structure the ways in which humans appear to be different from animals (as rational and reflexive beings with minds, intentions, and culture), they structure our notions of moral responsibility (only intentional beings with agency can be guilty) and organize the intellectual cleavages in our academic system (*Geisteswissenschaften* versus *Naturwissenschaften*). The philosophical distinctions between the internal versus external and rational versus empirical aspects of science are congruent with these fundamental cultural dualisms. They separate the pure forces of Reason from the empirical circumstances of science and thus provide a general rationale for the basic oppositions in our culture (p. 37).

In one paragraph Fuchs describes the world view of the Western scientist. Not surprisingly, Fuchs's analysis can be used to account for the problems encountered in integrating non-Western medicine into a cohesive medical model.

These problems are highlighted throughout the account of David M. Eisenberg (Associate in Medicine at Beth Israel Hospital, Assistant Professor of Medicine at Harvard Medical School, member of the NIH Alternative Medicine Program Advisory Council and primary author of the *New England Journal of Medicine* study) about

Model of External and Internal Events
Related to Theoretical Assumptions about
Medical Research and Scientific Communication RE: Nonwestern Medicine

EXTERNAL FACTORS
Social, Political, Economic

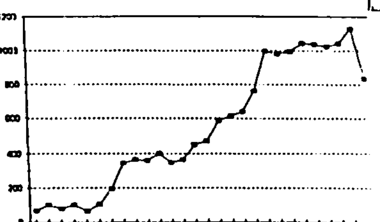


INFORMATION SCIENCE
|
Bibliometrics

SOCIOLOGY OF SCIENCE
|
Mapping of Author Collaboration
|
Invisible Colleges

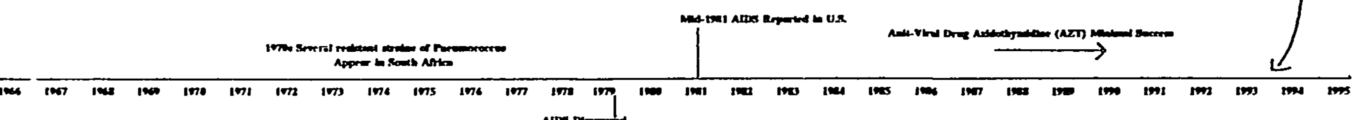
(Proposed for Future Research)

MEDIA STUDIES
|
Content Analysis of Televised & Published Interviews



Content Analysis of Research Articles

INTERNAL FACTORS
Funding, Mutations, Success/Failure, Conferences, New Diseases



CATALYSTS | **BARRIERS** | **DEBATE** | **COLLABORATION** | **CHANGE**

EXTERNAL FACTORS

POLITICAL EVENTS
TRAVELERS' ACCOUNTS
STAFF
FOREIGN EXCHANGE
CHANGES IN PUBLIC POLICY
GLOBAL COMPETITION
EMPOWERMENT MOVEMENTS

LANGUAGE

PRIMARY SOURCES
RESEARCHERS

DEBATE

ONGOING
ACRIMONIOUS
NEW JOURNALS
CONFERENCES
MEDIA COVERAGE

COLLABORATION

MULTIPLE AUTHORS
FORMATION OF INVISIBLE COLLEGES
INCREASED # OF CITATIONS
JOINT VENTURS

CHANGE

ALLEGIANCES
ACCEPTANCE
CODIFICATION
DOGMA
RECRUITMENT OF VISITNG SCHOLARS

INTERNAL FACTORS

EPIDEMICS
MUTATIONS
NEW VIRUSES
HOSPITAL POLICY CHANGES
FUNDING CHANGES
CHALLENGES FROM W/IN CLINICAL PRACTICE
RISING DRUG COSTS

CULTURE

NO EQUIVALENT
RESEARCH STYLE
CONCEPTS

SCIENTIFIC TRADITIONS

DIFFERENT GOALS
DIFFERENT CONSTRUCTS
INSTITUTIONAL NORMS

COSTS

TRAVEL
TELECOMMUNICATIONS
POSTAGE

FUNDING

FORMATION OF AGENCIES

PUBLIC AWARENCESS CAMPAIGNS

POPULAR CULTURE

T.V. SHOW SCENCES
STORY DEVICES IN NOVELS

TIME

1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995

Table 7
External Factors

1968-1970 Israeli-Egyptian Conflict - tensions impede foreign exchange
Dec. 3, 1971 India-Pakistan War -

July 26, 1971 James Barrett Reston reports on acupuncture anesthesia

Feb. 21-28, 1972 It might be possible to pinpoint the beginning of the exchange of information from East to West starting with President Richard Nixon's visit to the People's Republic of China.

May-June 1973 Liaison Offices opened in China and the U.S.
June 27, 1973 Cease-Fire Agreement in Vietnam
1976 Thai Military Coup
Jan. 1, 1979 Diplomatic Relations Established with China
Jan. 16, 1979 Shah leaves Iran
March 26, 1979 Israeli-Egyptian Peace Accord

August 1979- August 1980 Dr. David M. Eisenberg's studies Chinese Traditional Medicine at the Beijing Institute of Traditional Chinese Medicine as the first medical exchange student sent by the National Academy of Sciences.

1987 Vietnam announces package of economic reforms
June 3-4, 1989 Tiananmen Square Massacre
Aug. 2, 1990 Iraq invades Kuwait
June 21, 1991 Prime Min. P.V. Narasimha Rao assumes office, begins opening India up to the West for investment

....., 1994 Clinton agrees to U.S. investment in Vietnam

Table 8
Internal Factors

1979 Journal of Ethnopharmacology

1970s Tang (1984) states that during the 1970's a nationwide mass-survey began in the People's Republic of China "with the goal of determining the incidence of common types of cancer" (p. 48). Presumably, the government as a result encouraged research into finding a cure.

1970s Several resistant strains of Pneumococcus appear in South Africa
1979 AIDS Discovered

mid-1981 First report of Acquired Immune Deficiency Syndrome (AIDS)
.... Isolation of the human immunodeficiency virus (HIV)

1986 Anti-Viral Drug Azidothymidine (AZT) Minimal Success

November 1981 Opening of the Chinese Association for Integration of Traditional and Western Medicine.

Beginning of glasnost

Opening of former Soviet and East block archives

Activist environmental movement to save the rainforests, celebrity concerts to raise awareness of native peoples'

rights and knowledge of medicinal plants

1992's "Medicine Man".

being the first American medical exchange student to the People's Republic of China. During his year (August 1979 to August 1980) of study at the Beijing Institute of Traditional Chinese Medicine, Eisenberg studied one-on-one with the instructors, constantly trying to internalize a completely alien medical model. Acknowledging the problematic nature of trying to study a medical system through the lens of an opposing system (especially one that usually dismisses the other as quackery), Eisenberg writes

> Philosophically, the two schools follow different lines of scientific reasoning. The Western system proceeds along a line of a priori, cause-and-effect relations. The Chinese system employs a phenomenological, more circular logic. Both systems are internally consistent and capable of describing patterns of illness as well as methods of treatment. They are like two mathematical formulae applied to an identical problem. Both may work, but when placed side by side, the two models may nevertheless appear wholly unrelated.
>
> The common element in Chinese and Western medicine is chemistry--biochemistry. If the systems are both valid, they must both have the power to identify and change patterns of human chemistry . . . . The two systems can be studied on a biochemical and pharmacological basis. In fact, much of this work is already in progress in and out of China. (p. 58).

Both Fuchs's and Eisenberg's words are used here to stress the point that the theoretical model and approach to the study of scientific communication and paradigm change used in this study emerges out of the Western scientific tradition; however, the subject of the communication itself is one that in many cases cannot and possibly should not be studied using traditional quantitative nor qualitative study designs. Consequently, it will be left for future research to focus on design issues in the study of non-Western scientific and/or medical systems.

The other aspect of the model is that it is designed to identify paradigm change. It is assumed that there is sufficient documentation of dissatisfaction with the medical paradigm to conclude that Western medicine is in a state of crisis. Therefore, the theoretical model presented here is designed to capture "science-in-the-making" as

controversial statements compete with other statements for recognition and acceptance. As Fuchs writes "Objective reality cannot yet be mobilized in support of a particular statement, for it is the very nature of reality itself that is so controversial" (p. 55).

Visual Model 2, therefore, illustrates the catalysts (external and internal factors), barriers (language, culture, scientific traditions, and costs), debate, collaboration, funding, public awareness campaigns, and popular culture messages that ultimately lead to change over time. External factors are those events that fall outside of the everyday problems encountered within a scientific discipline. External events are usually publicized as taking place in the public arena and are usually not seen as having an immediate impact on scientific communication. Political events such as Nixon's trip to China and China's initiation of the Open Door Policy, traveler's accounts, summaries of one's foreign exchange experiences, publicized changes in public policy, global competition for markets and national standings in addition to empowerment movements such as the AIDS activist movement and Native American Indian Movement are all examples of external factors that may or may not impact on the exchange of scientific information pertaining to medicine.

Internal factors are those that do have an immediate impact on the laboratory or, in the case of medicine, on the delivery of health care. Epidemics strain resources and often challenge researchers to find cures that they cannot find in time to save stricken patients. Genetic mutations found within the bodies of survivors of disease and within viruses themselves all raise questions that must be addressed by attempting to work within the prevailing paradigm. If answers cannot be found, then the paradigm itself is threatened.

New viruses may also stress the system as well as changes in hospital policy

resulting from funding changes. Systems under stress are more apt to change than systems maintained by the status quo. Patients may also challenge the system as they decide they want a more personalized and holistic patient-physician relationship. Finally, economic events that usually fall under the category of external factors may be classified as internal in the case of rising drug costs. Physicians must choose which prescription to give to patients not on the basis of their efficacy but on the basis of whether the patient can afford to purchase to the drug over time. Such a dilemma raises ethical issues that would otherwise not be brought to the physician's attention and may in itself serve as a catalyst for change.

Any model of international or cross-cultural scientific communication must include language and cultural barriers as well as barriers resulting from the fact that not all peoples share the same scientific tradition. Different groups have different goals and different perceptions of the role of science in society and in their own personal lives. Communities of researchers may have different constructs and different institutional norms that may dictate what problems may be addressed and which research designs can be chosen. An additional barrier is the simple one of cost. Travel across continents is extremely expensive and even if one travels in the fastest intercontinental jets, it still takes many hours to cross time zones. Telecommunication costs have fallen dramatically but they are still prohibitive from some locations. Postage is another cost that many overlook. All these costs must be taken into account in a study of international scientific communication as they all serve as barriers to face to face communication.

If communication takes place, then debates arise. Debates are most likely to occur throughout the entire process and may be acrimonious at times. New journals

will appear, conferences will be held and the media will begin covering the events and findings as the process unfolds. Eventually one will see the formation of invisible college, an increase in the number of citations to pertinent studies, an increase in joint ventures and increasing numbers of visiting scholars traveling back and forth.

Funding issues may arise and one might see the formation of specific agencies created for the sole purpose of funding new research. Change will occur as the new paradigm gains acceptance and is codified in textbooks thus replacing the old with a new dogma. Departments and agencies will grow with the recruitment of staff the public will be informed of the changes through different kinds of advertising and public awareness campaigns and the popular culture will begin to reflect the changes. Television programs will depict scenes in which the new paradigm is evident in the dialogue or the actions of the characters. Story devices in novels will also serve to convince the public that a new paradigm is in effect.

Time, however, is the most important factor and it must never be ignored. Change takes place over a period of time and may never be completed. Numerous studies have documented how crucial patents have been submitted sometimes within hours of one another. Scientific claims have been shown to have been published simultaneously even though only one is usually credited as having made an impact. It may be possible to pinpoint a precise moment in time when an event occurred but it is impossible to state how many other events may have occurred at the same moment for change to occur.

SECTION VII: PRELIMINARY STUDY

Growth of the Literature on Non-Western Medicine

Preliminary Study

Introduction

A study designed to explore whether or not there is a sufficient body of literature on non-Western medicine to justify a full-scale study was conducted during the Spring 1993 semester as part of an independent study under the direction of Dr. Pamela Spence Richards. Subject headings were identified and references coded and counted over time to determine whether or not there have been any changes in the patterns of growth that can be detected in simple graphs of the titles printed in *Index Medicus*. The other main purpose was to identify problems and issues surrounding the medical literature on non-Western medicine that need to be addressed.

Definitions

For the purpose of this study, non-Western medicine is defined as that which was first indexed by the National Institute of Health's *Index Medicus* under the subject headings "Medicine, Arabic", "Medicine, Hindu", "Medicine, Oriental" and "Medicine, Primitive". Over time these subject headings were either changed or split into separate categories as shown in Table 9. In 1988 the subject heading "Drugs, Chinese-Herbal" was created. Prior to 1988 articles on Chinese drugs were included under the subject heading "Medicine, Oriental" or "Medicine, Chinese-Traditional".

A search of the subject headings used in *Index Medicus* for the period 1970 through 1992 revealed that most of the material is indexed under "Medicine, Arabic" through "Medicine, Traditional". The volume for each year that

Table 9
Index Headings

African-Traditional	Started in 1992
Arabic	Started prior to 1970
Ayurvedic	Formerly, Hindu
Chinese-Traditional	Started in 1987
Herbal	Started in 1981
Hindu	Changes to Ayurvedic in 1981
Oriental	Changes to Oriental-Traditional
Oriental-Traditional	Started in 1983
Primitive	Changes to Traditional in 1981
Traditional	Started in 1981

contained the subject "Medicine" was photocopied resulting in a total of 82 pages covering 1970 to 1992. After completing a simple number count of the articles listed under each subject heading, the researcher discovered that in 1987 there were 382 articles listed under "Medicine, Oriental-Traditional" and then in 1988 there were only 5. Thus, it was necessary to return to the indexes and check the guide to subject headings. Noting that most of the articles listed under "Drugs, Chinese-Herbal" were similar to those that used to be indexed under "Medicine, Oriental" and/or "Medicine, Oriental-Traditional", the author decided to photocopy that section for 1988 through 1992 and add those references to the general count.

Findings indicated that there was a 1,062.5 percent increase in the number of articles on non-Western medicine from 1970 to 1992 with a 3,587.5 percent increase in the number of pharmacological studies. Such results reveal that there was sufficient data provided in *Index Medicus* on languages and journal titles to justify an extended study utilizing full bibliographic records from MEDLINE.

Purpose

This study, therefore, is a comprehensive and extensive use of full electronic bibliographic records in an attempt to document a scientific paradigm change within the field of medicine based on the results of a preliminary study of references printed in *Index Medicus*. The first part of the study employs bibliometric analysis to identify time periods where changes in growth of the literature begin. Additional analysis is expected to uncover invisible colleges and to test the theories about barriers to international scientific communication.

Based on the assumption that when there are newspaper, magazine, radio and television reports about a specific trend in medicine, psychology, criminology, education (or any of the other academic fields) there is a phenomenon occurring within society, it is highly probable that the same phenomenon is being discussed (or has just been discussed) in the academic, scientific and scholarly literature. Given the fact that there is sufficient evidence that the media and the public is now interested in both alternative medicine and non-Western medicine the following research question is raised:

Preliminary Research Question 1 (RQ 1): Are there patterns of growth within the medical research literature that indicate an increase in research interest on non-Western medicine?

Bibliometric Studies

Borgman (1990) writes, based on definitions given by several authors, that scholarly communication is the study of

> how scholars in any field ... use and disseminate information through formal and informal channels. The study of scholarly communication includes the growth of scholarly information, the relationships among research areas and

> disciplines, the information needs and uses of individual user groups, and the relationships among formal and informal methods of communication (p. 13).

Borgman also presents what she notes is the most widely accepted definition of bibliometrics written by Pritchard in 1969 stating that bibliometrics is a tool used

> to shed light on the processes of written communication and of the nature and course of development of a discipline (in so far as this is displayed through written communication), by means of counting and analyzing the various facets of written communication (p. 13).

Bibliometrics is also (according to Raisig, 1962)

> the assembling and interpretation of statistics relating to books and periodicals . . . to demonstrate historical movements, to determine the national or universal research use of books and journals, and to ascertain in many local situations the general use of books and journals (p. 13).

The above definitions and purpose statements provide the framework for this study. There are several aspects that can be covered simultaneously when analyzing large data sets of references and abstracts, thanks to the enhanced features provided by modern 486/66 and pentium chip personal computers. Issues listed in Table 10 as well as parallel studies of the citations to a given set of references can all be covered now in the initial design of a relational database consisting of bibliographic references and abstracts. Previous studies were limited by the tools available and as a consequence researchers have not been in a position to test several theories of scholarly communication at the same time in order to develop a model of communication between researchers.

Language of Publication

Large (1983), Manten (1980), Neumann (1953) and others have focused on the barriers to international scholarly communication. Language, culture and specific country research interests (e.g. Nordic cardiovascular research cited by Luukkonen

(1990) or botanical studies of rare indigenous plants) are all barriers to the transmission and dissemination of information from one cultural area to another. Except for Garfield (1983) few studies of scientific output from Third World countries have addressed the issue of coverage in the major on-line and print indexes. Garg and Dutt (1992) noted that Indian scientists are under-represented as only 11 source journals out of the 300 regular, refereed journals and 1200 non-refereed journals published in India are cited in the 1987 *Science Citation Index*. On the other hand, topics which are of interest to the global scientific community are usually published rapidly and translations are readily available. Research topics covered in languages other than English, French and German are often neglected by the international research community.

Manten (1980) discusses the role of language in international scientific communication and points out that Latin retained its dominant role until the late nineteenth century when nationalism spread throughout Europe and there was a drive toward publishing in one's native language. Manten also states that the dissemination of knowledge is obstructed by the high cost of original publications, the great volume of literature published, "poor availability particularly of foreign books or journals" and "problems of access to the vernacular of other countries" (p. 17). These barriers are of particular concern to scholars attempting to conduct research into an area where the language is printed in a non-Roman script. Large (1983) writes that English took over from Latin and German as the new international scientific language especially after World War II. The corollary is if medical research falls under the heading "science", then most medical research has probably been published in English; however, the literature on non-Western medicine has traditionally been written in non-Western

Table 10
Summary of Bibliometric Studies

Priority in scientific discovery and nationalism	(Griffith, 1990, p. 35)
Classification of research using the authors' terminology or assigned terminology to trace the flow of ideas within and across disciplines	(Borgman 1990, p. 16)
Time lags for publication of papers written in non-European scripts or languages	Cited by Griffith
Technology transfer from universities and other organizations conducting basic research to private companies that commercialize the research (i.e. Shaman Pharmaceuticals)	(Rogers & Cottrill 1990 p. 158)
Development of a single research speciality within the medical field, i.e. AIDS research	(Self, Filardo & Lancaster 1990, p. 171)

languages.

Itzchaky (1979) in a study of the international research literature in biblical and ancient near-east studies from 1923 to 1971 found that although German, English, and French were still the main languages of research, since 1923 their "combined proportion dropped among the source documents, but increased among the cited references, indicating that more research is being published recently in other languages but its use is still relatively low" (p. iv). Similarly, there was a "considerable decrease in the proportion of research published in the three leading countries (Germany, Britain, and the U. S.) combined, along with an increase in the share of the `small publishers' (Holland, Israel, Spain, et cetera) (p. iv). As a field becomes more global in its appeal, it is expected that there will be changes in the country of publication of the core literature as well as changes in the preferred languages of publication. Similar findings are predicted for the study of non-Western medicine.

This raises several questions:

PRQ 2: What are the languages of the articles being published on non-Western medicine?

PRQ 3: Where are the articles being published, i.e. what countries are listed by MEDLINE under the field for country of publication?

PRQ 4: Is English the dominant language, i.e. are the majority of articles published in English?

Scholars (Large, Luukkonen, Manten, Merton, Neumann, Price) have noted that there are various language and cultural barriers to the exchange of information, therefore, it is predicted that:

Preliminary Hypothesis 1 (PH1):

Articles on non-Western medicine first appear in non-Western journals and gradually begin to appear in Western journals.

Growth Patterns in Scientific Literature

Price and others have all discussed various growth patterns of scientific literature. De Mey (1992), synthesizes much of this work. In a series of figures De Mey depicts linear, exponential and logistic growth (p. 113) adding that "While the growth of science might seem rapid and impressive, it does not occur like an explosion, expanding at the same rate in all directions" (p. 114). Instead rapid growth in a field "should be attributed to the *extremely fast growth of some subdisciplines and specialities*, levelled out by slower growing areas, and *fast growing areas* in science tend to be relatively *young areas*" (p. 114). The logistic growth or S-shaped slope is the one according to Price which applies to the growth of science as a whole and which, according to De Mey, "seems equally applicable to the smaller units of growth on the micro-level" (p. 114). A graph depicting logistic growth illustrates "a combination of exponential growth and asymptotic growth whereby, after an initial exponential phase, growth gradually slows down as the population approaches saturation level" (p. 113). In macroeconomics slopes of such population growth are coded in segments marked for rapid growth or growth illustrating increasing interest in a field followed by a period of maturation, then saturation and then diminishing interest.

De Mey also lists bibliometric indicators in a table outlining the metabolism of fast-growing and slow-growing areas. Although De Mey's table consists of traditional citation analysis variables including the length and type of publication, it provides a

useful framework for evaluating the emergence of a discipline or, in the case of this study, the emergence of a new direction within an established field of medical research. As interest in non-Western medicine becomes apparent it is logical to assume, based on the work of Price, De Mey and others, that such changes should appear within graphs of the number of articles over time and that a graph depicting such growth should illustrate logistic growth. For the purpose of this study, however, it will be sufficient to simply demonstrate that there has been an increase in the number of articles under each topic of non-Western medicine at that increases can be seen to have occurred at specific points along a timeline.

PRQ 5: Is there a change over time in the number of articles on any particular topic?

Analysis of the reports indicating growth of the literature as well as changes in topics over time can be used to answer the following:

PRQ 6: How has the literature within each topic grown from 1966 to 1993?

PRQ 7: How many articles were published in each language within each topic each year? How have these results changed over time?

PRQ 8: How have the types of articles changed over time? Are there more clinical trials or historical reviews in any given time period for any given topic?

PRQ 9: Were there more general descriptive studies in the 1970s compared with the 1980s?

PRQ 10: When do the first clinical trial studies appear? Do they increase proportionally over time?

PRQ 11: Is there an increase in the number of articles published in any given language over time?

PRQ 12: Do topics appear in articles published in languages other than English before

they appear in English or vice versa?

PRQ 13: When do articles in this data set appear on Acquired Immune Disease and do these articles impact on the overall pattern of growth indicating a possible internal or external factor?

Peer Review System

The final area of interest in bibliometrics is the study of the peer review system. In March 1990 the prestigious *Journal of the American Medical Association* (*JAMA*) published 24 selected proceedings from the First International Congress on Peer Review in Biomedical Publication. Empirical studies of the peer review system in medicine and the biochemical sciences published in that issue along with studies published in other medical journals (e.g. *Annals of Medicine*) indicate that the editorial systems and processes of the core journals differ from those of "rank and file" journals.

Garfield (1979) supports this thesis by stating that

> The most significant research tends to be submitted to the highest prestige journals. This so-called "Matthew" effect means that the best journals receive the best manuscripts. But occasionally extremely high quality work bypasses the prestige journals in favor of new or less prestigious journals. For example, a group of scientists may break away from the pattern described by the Matthew effect and a new high prestige journal will emerge. This was the case with *Tetrahedron*, where the established chemical journals did not exhibit enough flexibility in meeting the needs of even highly esteemed scientists.
>
> In other cases, a large backlog of mediocre manuscripts can stand in the way of a significant breakthrough. Since priority in scientific discovery is still important, the breakthrough paper may be submitted to a newer or less prestigious journal for quicker publication. In a democratically functioning editorial system, new journals will arise when older journals are too slow or too inefficient to meet authors' needs. That is why, perhaps there is so much discussion today of the so-called synopsis journal. One such journal is the *IRCS Journal of Medical Science*, published in the UK. Another is the *Journal of Chemical Research* published by the Chemical Societies of the United Kingdom, Germany and France (p. 320).

This passage contains several points that address the social process of scientific communication applicable to this study, i.e. 1) research that is judged as being of the highest calibre is submitted to and accepted by the most prestigious journals; 2) high quality research has a higher probability of being read if it is published in a prestigious journal with a wide readership if we assume that certain journals will be scanned and/or read by the majority of scientists who subscribe; 3) the more manuscripts that are submitted to a particular journal, the more are rejected; 4) priority and the public recognition of claims and findings are still motivating factors as is the seeking of prestige; and 5) scientists who cannot get their work published often form new journals which in turn rise or fall in the rankings. In addition, it can be inferred that scientists who are proponents of new ideas (i.e. new paradigms) will not have their work accepted, at least at first.

Preliminary Hypothesis 2:

> Specialized journals will begin to appear to provide an outlet for authors whose work is rejected by or not readily accepted by existing journals.

Studies in Essays of an Information Scientist

Bibliometric studies of medical literature exemplified by those published within the series *Essays of an Information Scientist* (Table 11) do document the importance of specific journals and specific fields but they do not test specific theories of scientific communication nor do they discuss paradigm changes. Garfield presents numerous tables of data. Each article documents patterns and trends in the medical and life sciences literature but Garfield does not attempt to present an overview of the field as a whole nor does he test any theories of paradigm change or growth in the literature, i.e. Lotka's Law. Pharmaceutical research was not presented as a separate

Table 11
Summary of Citation Analysis Studies

	Year	Vol.
Differences Between Citation Patterns Between The "Journal of the American Medical Association" And the "New England Journal of Medicine"	(1977)	1
Highly Cited Biochemistry Papers	(1980)	3
Most-cited Preclinical Basic Research	(1981)	4
Growth of Biochemical Articles	(1981)	4
Abstracting the Biomedical Literature For the Medical Specialist	(1981)	4
Most Cited Articles in the Life Sciences	(1981)	4
1,000 Most Cited Authors in Cardiology, Endocrinology, Gastroenterology, Nephrology, Neurobiology, Neurology, Neuropharmacology, Nuclear Medicine, Oncology, Pathology, Pharmacology, Psychiatry and Surgery	(1983b)	5
100 Classics from the "New England Journal of Medicine", "The Lancet" and "Annals of Internal Medicine"	(1985)	7
Most-cited 1984 Life-sciences Articles on Aids Research	(1988)	9
Impacts of the Leading Medical Journals	(1989)	10
Most-cited Papers from the "British Medical Journal" Highlighting Their Role in Epidemiology	(1989)	10
Choosing Landmark Papers from "Jama"	(1989)	10
Legacy of Sir Henry Wellcome	(1990)	11
Most-cited 1986 Life Sciences Articles	(1990)	11

entity within the series.

Not surprisingly, no bibliometric studies of medicine as a whole were located in the indexed literature. Those studies not included in Garfield's collection that document the history of medicine have all tended to focus on specific accomplishments made by individual physicians, surgeons and pharmacists. Lie (1991) in *Synthese*, outlined the theory change in biomedicine using a case study from cardiology providing an overview of the controversy during the 1920s over whether mechanical or chemical factors could explain the pain felt by angina patients. Numerous other such case studies exist describing the development of new techniques and new drugs but no study appears to have focused on the paradigm shift from homeopathy to allopathy in the nineteenth century nor on the changes in the overall paradigm itself that have occurred since the mid-nineteenth century.[16] Two citation analysis studies published in Chinese in *Chung Kuo Chung Hsi I Chieh Ho Tsa Chih* (Chinese Journal of Integrated Traditional and Western Medicine) published in 1992 were located, as they had both been coded under the MESH heading "Bibliometrics". These two studies, unfortunately, could not be obtained and translated in time for review.

The only citation analysis study entitled "China's impact on American medicine in the seventies: A limited and preliminary inquiry" was located only at the last minute while editing MESH headings. This reference by McQueen in a 1985 issue of *Social Science and Medicine* did not have the MESH "Bibliometrics" coding. Instead it was only located because it was listed as discussing "Periodicals". Fortunately, the study's title states that it is only a limited and preliminary study. McQueen's approach to graphing the number of references (he uses the term citations) found in *Index*

Medicus under acupuncture and under "Medicine, Chinese-Traditional" was to graph the percentage of articles listed (cited) instead of using the raw data.

McQueen graphs the articles on acupuncture in *Index Medicus* from 1969-1978 where *N* = 579. Using data from tables for each of the 9 subject areas prepared separately and then merged to form Tables 12-14 (included at the end of this chapter), one sees that for that time period *N* = 1,407, more than double the number obtained using the data from the print indexes for the year in which the references were received and entered, not the year of publication. McQueen also graphs articles "concerning `alternative healing'" and articles concerning "acupuncture and osteopathy" and "acupuncture and chiropractic". These numbers are also probably in error now that we can see that there is a significant time lag between publication and inclusion in the indexes, a point McQueen makes but was unable to demonstrate at the time.

McQueen also graphs the percentage of articles listed in the *New York Times Index* stating that there is a correlation between media attention and medical research. The most valuable contribution McQueen makes is his model of diffusion of the Chinese medical model into the United States. Chinese medical techniques and health care delivery are entered into the schema at the macro-level as McQueen states "The infusion of knowledge . . . comes into the United States at the macro-level from an exogenous source" (p. 934). This information flows to many target populations, specifically American health professionals, through to acceptance at the professional level. McQueen concluded that this end product of acceptance never occurred. Personal characteristics of the adopter, a desire to integrate the new knowledge into practice and the "ability of the individual to actually put the adopted ideas into

practice" were necessary conditions that McQueen felt had not been met because in order for an adoption of an innovation to occur, there must be homophily - defined by quoting Rogers and Shoemaker's 1971 *Communication of Innovations: A Cross-Cultural Approach* as the "degree to which pairs of individuals who interact are similar in certain attributes, such as beliefs, values, educations, social status, and the like" (p. 934). As mentioned elsewhere, Chinese medicine involves a completely alien cosmology and belief system as well as a language written in characters instead of in a Roman script spoken using tones to distinguish meaning.

This article is also interesting for the author concludes that any attempt to document the impact of the Chinese model should include content analysis of the articles and of media reports as well as a tracking of symposia. It is unfortunate that this, of all articles, should have been lost in the literature search by the fact that it was not coded under bibliometrics. It is coded under "Diffusion of Innovation", "Information Services", "MEDLARS" and "Periodicals" and was located when editing the MESH headings in a general sort. It was not picked up in the reading of all the titles because the first set to be marked were "Clinical Trials" and by the time the "Reviews" were marked the title search was abandoned leaving the "Journal Articles" unprinted. Ironically, McQueen noted the errors in retrieving material that uses so many variations in terminology. Fortunately, it was identified and a copy was available in the library so McQueen's work can be recognized as setting a precedent.

One other work that is significant is an article by Frederick F. Kao, M.D., Ph.D. of the Institute for Advanced Research in Asian Studies and Medicine at Hofstra University. There are no references and it reads more like an editorial but it has a MESH indicating that it is a "Journal Article" appearing in *American Journal of*

Chinese Medicine in 1992. Most of the article reflects the current findings but what Kao states is this:

> The author envisages that the process of integration of all indigenous medicines of various cultures will end in the 21st century, at which time the "ecumenical medicine" - a term first used by Joseph Needham - movement will not be necessary, for all forms of medicine will be one system. The author has a great interest in the furtherance of indigenous medicine and their integration into one system, but his views and observations, as all endeavors in humanity, are not infallible (p. 1).

Kao goes on to document all of the external events cited in this study in addition to providing commentary concerning the hostility he witnessed. Unfortunately, Kao proceeds to outline the history of different aspects of traditional medicine rather than continuing his argument that the Chinese medical model is being diffused throughout our medical system resulting in a paradigm change. Kao's article predates this study by three years so possibly the change triggered by discussion surrounding the Moyers's program was not so evident.

Method

Full bibliographic records of articles indexed by the National Institute of Health's *Index Medicus* service were downloaded from a CD-Plus MEDLINE workstation at Robert Wood Johnson Library in New Brunswick, New Jersey on June 12 and June 18, 1994. 18,269 full records were downloaded using the MEDLARS format, imported into Quattro Pro 5.0 for Windows, edited and assigned line numbers. All 18,269 references, totaling 505,906 lines of data, were then exported to Monarch 1.0 for Windows, parsed and MEDLINE accession codes appended. Records were then exported to Quattro Pro for further editing and sorting. Records were merged to form 21 master tables. Queries for each table were designed to extract records according to field delimiters and then exported to a series of linked tables within a

relational database using Paradox 5.0 for Windows. Duplicate records were then purged. 15,561 unique records were used to generate a series of *ad hoc* reports to test 33 hypotheses.

The original 8 MESH headings used for retrieval (Drugs, Chinese-Herbal; Medicine, African; Arabic; Ayurveda; Chinese-Traditional; Herbal; Oriental-Traditional; Traditional) did not include Acupuncture. The ease of downloading compared with photocopying print indexes led to the inclusion of what turned out to be a very large data set. Not surprisingly, these headings were found to overlap in that once all the references for each topic were entered into their respective databases, duplicate references were found when the databases were merged. Thus, titles were coded as they were entered in alphabetical order so that the interdisciplinary (from the standpoint of this study) studies were coded as follows: AC = Acupuncture; AF= Medicine, African-Traditional; AR = Medicine, Arabic; AY= Medicine, Ayurveda; CT = Medicine, Chinese-Traditional; DR = Drugs, Chinese-Herbal; HB = Medicine, Herbal; OT = Medicine, Oriental-Traditional; and TR = Medicine, Traditional.

In order to provide the most detailed and accurate portrayal of the literature, each category was counted across the timeline. In this way the reader can take note of the coverage on any given combination of topics for any language, country or publication type. Each category was then given a subject heading classification number for easy reference.

Subject Headings

Before the duplicates were purged from the master tables, there were 5,330 references on acupuncture, 58 on Medicine, African-Traditional, 353 on Medicine, Arabic, 441 on Medicine, Ayurveda, 3,064 on Medicine, Chinese-Traditional, 627 on

Medicine, Herbal, 3,028 on Drugs, Chinese-Herbal, 2,480 on Medicine, Oriental-Traditional, and 2,877 on Medicine, Traditional. Each article's unique identifier (UI) was coded for its corresponding subject heading regardless of whether the MESH heading was coded by MEDLINE as a major heading or not. That is to say, if the reference was retrieved during the search on the CD-Plus system using the truncation symbol, #, then the reference was given one of the codes listed above, i.e. AC, AF, et cetera. Matches were made using a series of queries after which the references were coded as AC,AY; AC,DR; et cetera.

No articles were found to be classified by MEDLINE as containing information about Acupuncture and Medicine, Arabic or Acupuncture and Medicine, African-Traditional. References were found for almost all other combinations as seen in Tables 12 - 14. All the MESH headings were extracted and recoded to indicate whether the article contained information on drugs (DR), philosophy (PH), research designs (CR - added to MEDLINE's Case Report code), places (LO), and history (HM). MESH headings indicating the sex (SX) and age (AG) of the subjects were also coded. Similarly, each heading for the 9 key areas plus the heading "Alternative Medicine" were extracted and coded. The MESH headings Animal and Human were coded AN and HU respectfully and all animal species were coded as SP. These data are quite rich but proper analysis is outside the scope of this study at this time.

Findings

1,811 unique journals were identified as publishing articles on non-Western medicine. Each title was matched with the 1994-1995 edition of *Ulrich's International Periodicals Directory*'s listing of refereed serials and coded accordingly by keying in "R" if the serial was refereed into the "key" column. If a title was affiliated with a research society or professional organization or research institute, the affiliation was keyed-in into a separate column. Time constraints prevented all titles from being matched with their entries in the main section of the directory so only refereed serials and titles used in the sample set were checked.

Results

PRQ 1: Are there patterns of growth within the medical research literature that indicate an increase in research interest on non-Western medicine?

Graphs for each topic were generated and previewed on the computer screen. Since acupuncture was the one field where there were data for each year a graph of the number of articles received each year on acupuncture was generated from Table 12 (Figure 1). A second graph (Figure 2) was generated to test whether there was a difference in the pattern of growth using the actual year of publication instead of the MEDLINE accession year (Table not included).[17] Both graphs reveal a sharp increase beginning after 1971. The drop in output for 1993 is probably due to the time lapse between the time an article is published and the time it is received by MEDLINE. This explanation is supported by comparing the differences between Figures 1 and 2. One can see that there are sharp increases and decreases in the number of articles received. In contrast, the number of articles published in any given year steadily increases or decreases as seen in Figure 1.

Figure 1 Acupuncture 1966-1993
Year of Publication

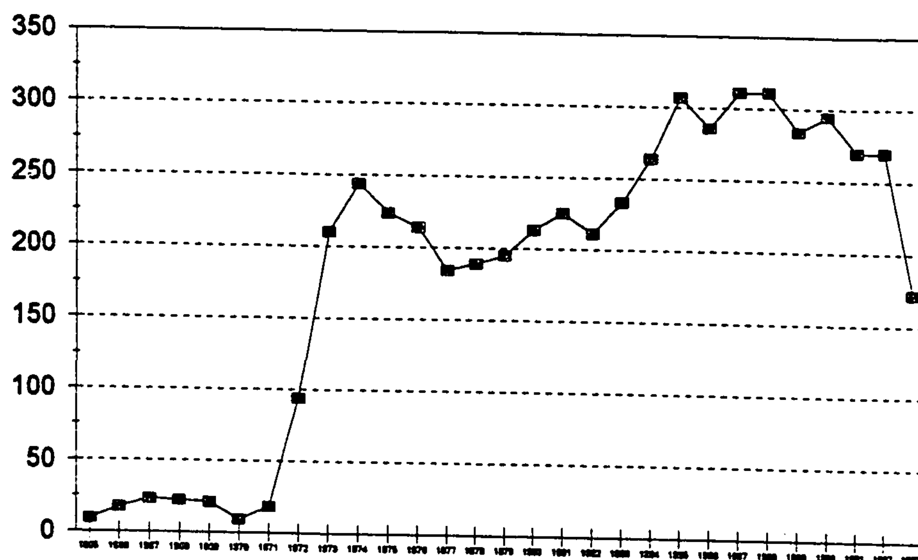


Figure 2 Acupuncture 1966-1993
Medline Accession Date

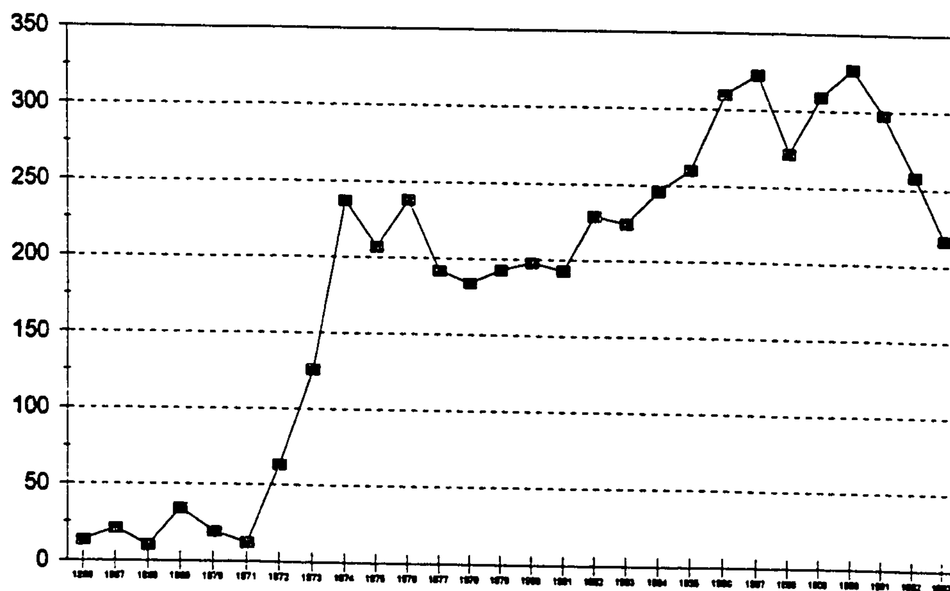


Figure 3 is a graph of the entire data set. Based on the pattern seen in Figure 2, it is assumed that the numbers for 1993 will be higher once all the journals are indexed by MEDLINE. Discarding the drop that follows 1992, therefore, one can see an increasing pattern of interest in non-Western medicine as a whole.

Graphs generated on the screen of the number of journal articles for the rest of the topics reveal that there was no recognizable pattern for Medicine, Arabic (Figure 4). Increasing interest appears in Ayurveda (Figure 5) from 1986-1992 but there was no pattern prior to 1986. Medicine, African-Traditional cannot be graphed given the fact that it was created in 1992. There were no articles on Chinese-Traditional (Figure 6) until 1974 after which there was a doubling between 1981 and 1983 followed by a 50% gain each year peaking in 1986 and then falling down to below 100 by 1992. At the same time, the number of articles extracted out by MEDLINE as Drugs, Chinese-Herbal (Figure 7) increases to levels above those found under Chinese-Traditional, leading one to infer that much of the material under the heading Chinese-Traditional was probably oriented toward drug research.

In a way this assumption is supported by the data on Medicine, Herbal (Figure 8) which exhibits an irregular but increasing pattern. The graph of Medicine, Oriental-Traditional (Figure 9) is interesting for here the interest peaked before 1974. The final area, Medicine, Traditional (Figure 10) illustrates a more regular pattern of increasing interest with peaks that might indicate years during which there was activity generated in part because of particular external or internal factors.

Languages

PRQ 2: What are the languages of the articles being published on non-Western medicine?

Twenty-nine unique languages were identified for the entire data set along with 5 combinations (English-Chinese; English-French; English-German; German-French; and Spanish-Latin). A sort of the languages of publication (Table 13- subtotals extracted separately) to answer research questions 2-12 reveal that 52.46 percent of the articles on acupuncture were published in English, 14.65 percent were published in Russian and only 11.95 percent were published in Chinese. Only French (2.98%), German (5.85%), Italian (2.93%) and Japanese (2.36%) accounted for percentages higher than .99 percent. As shown in Table 13, 26 languages were identified for acupuncture. In addition, 3 bilingual combinations were identified.

Figures 11, 12, 13, 14, 15, and 16 illustrate the pattern of growth for all topics published in English, Chinese, French, German, Japanese and Russian. The pattern of growth of English language articles (Figure 11) parallels the pattern seen in the total number of articles per year but varies from the total published in England and the United States. Articles in Chinese (Figure 12) really do not begin to appear regularly until 1979 so one must ask why material from Taiwan, Hong Kong, Singapore and other countries in the region with large Chinese speaking communities is not represented.

Articles in French (Figure 13) do not seem to have any pattern. German language articles (Figure 14) increase after 1972 but then fall dramatically after 1979. There are more articles in Japanese (Figure 15) in 1992 than any other year except 1989 but the number of articles in Japanese is still low in comparison. Russian language articles (Figure 16) increased after 1975 and then fell after 1980. One can definitely see the impact of the political turmoil on scientific output as the Soviet Union collapsed.

Figure 3: Non-Western Medicine
All References (1966-1993)

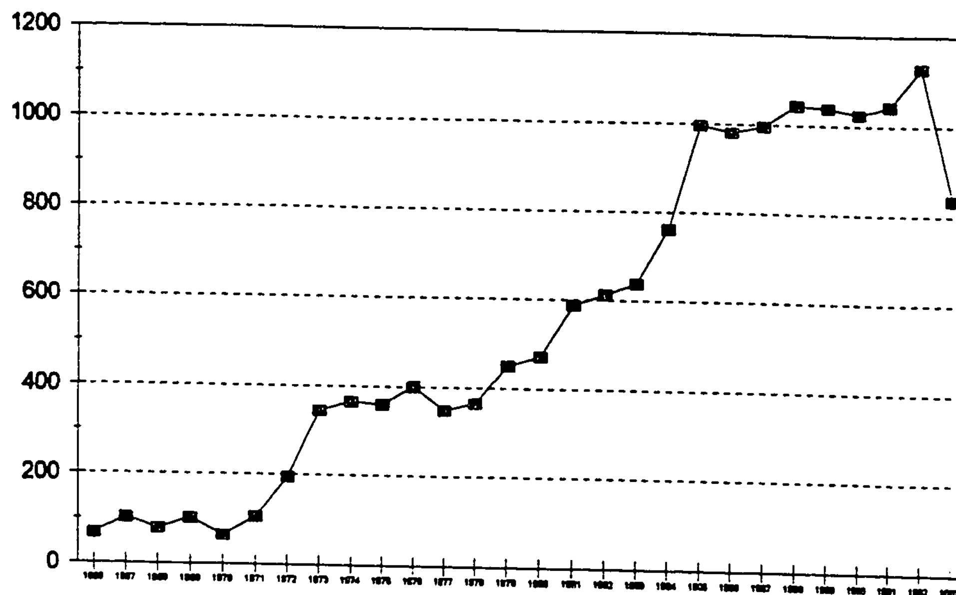


Figure 4: Arabic
1966-1993

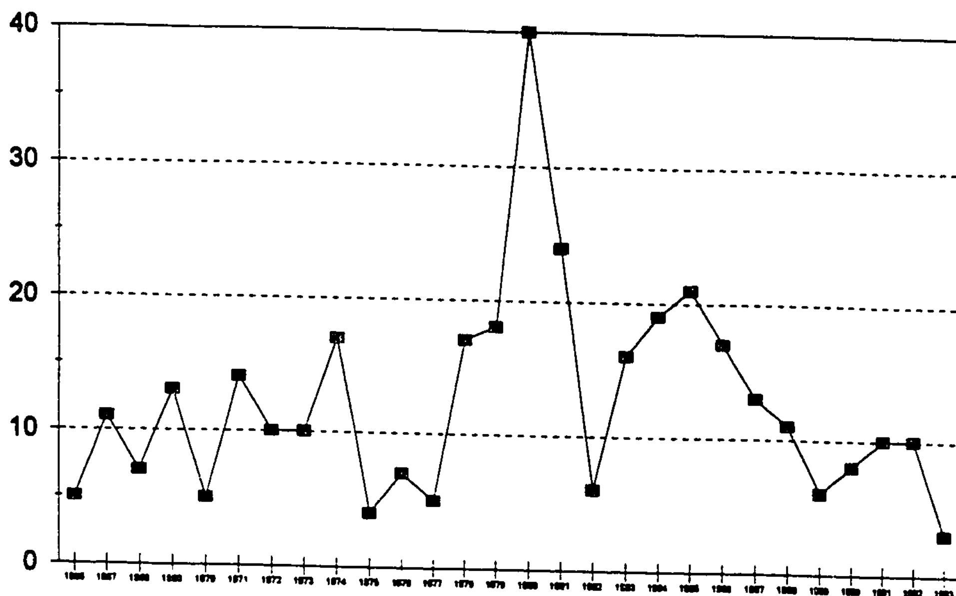


Figure 5 Ayurveda
1966-1993

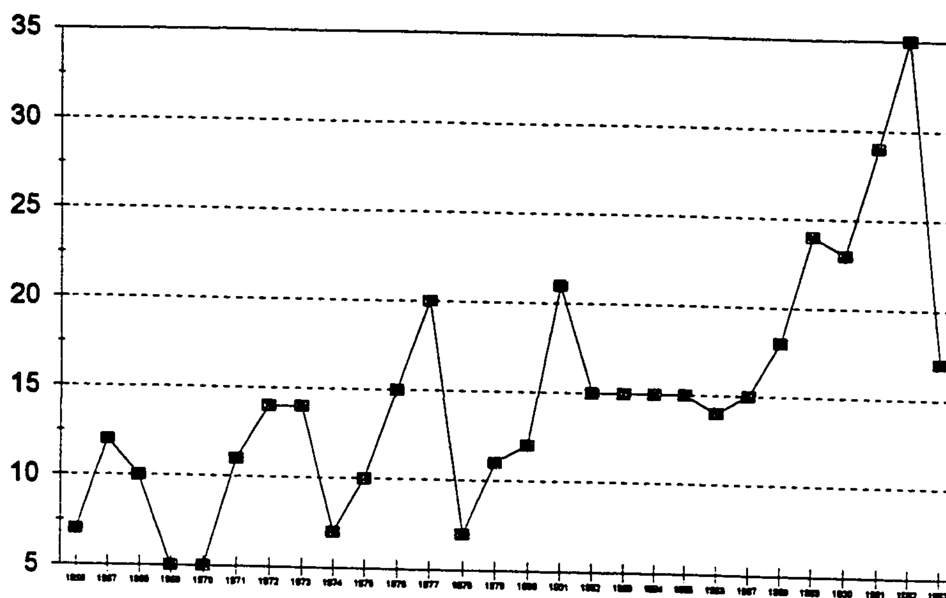


Figure 6 Chinese-Traditional
1966-1993

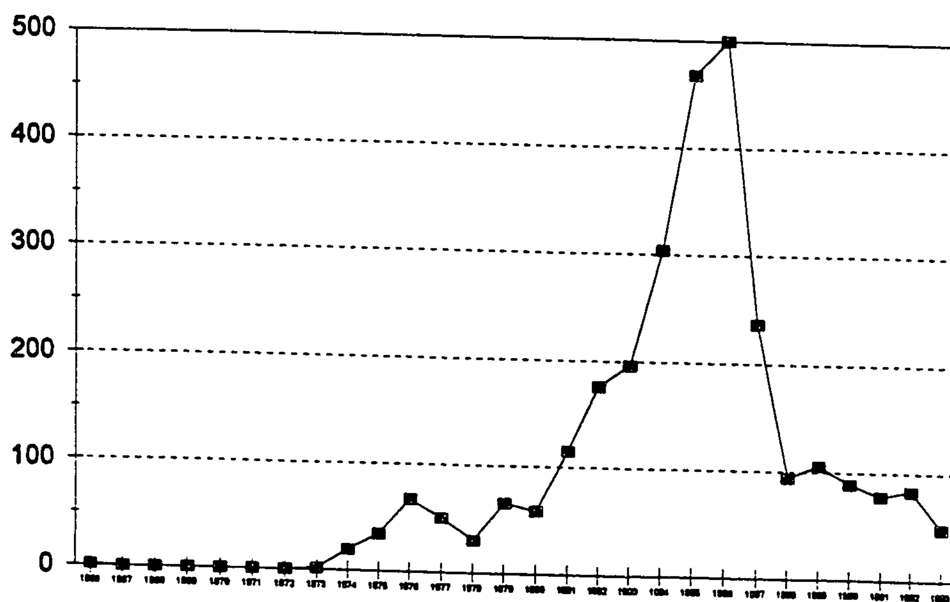


Figure 7 Drugs,Chinese-Hebal
1966-1993

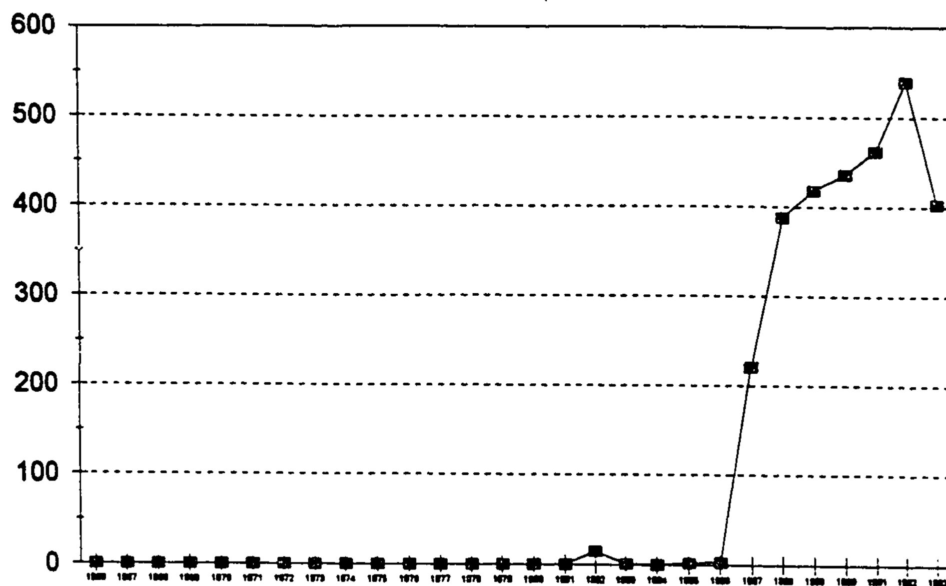


Figure 8 Medicine, Herbal
1966-1993

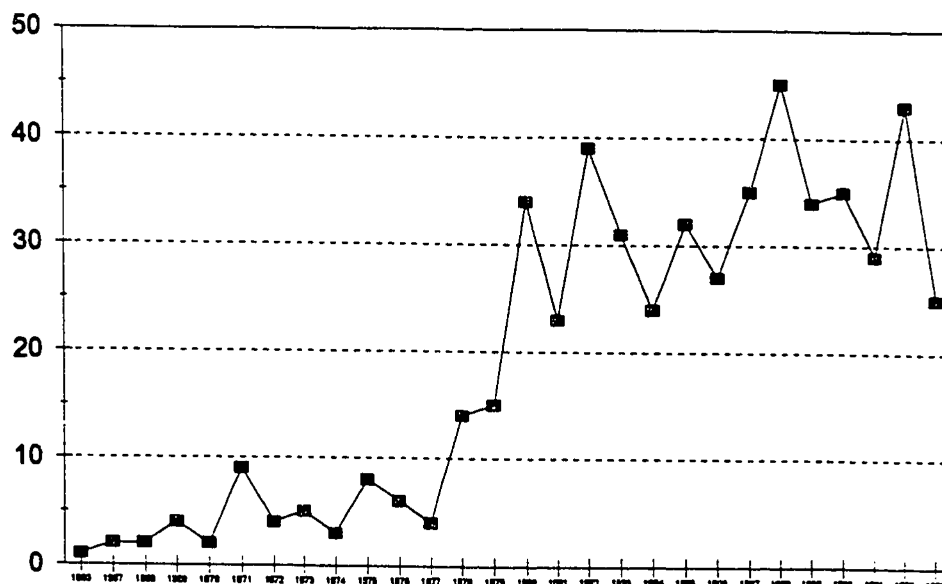


Figure 9 Oriental-Traditional
1966-1993

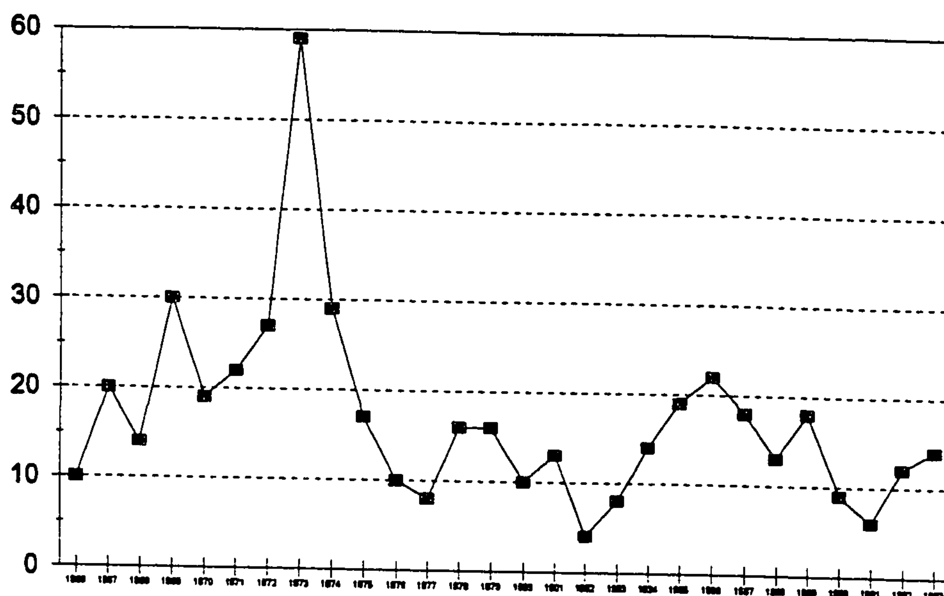
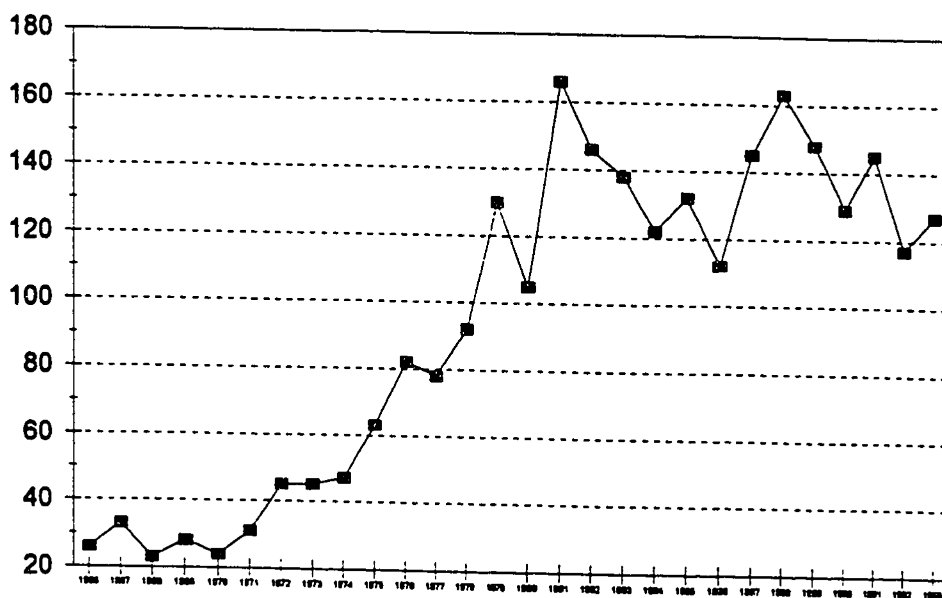


Figure 10 Medicine, Traditional
1966-1993



Countries

PRQ 3: Where are the articles being published, i.e. what countries are listed by MEDLINE under the field for country of publication?

79 countries were identified for the entire data set. Summary data appear in Table 14. Unlike the data on languages, there are more subcategories for each unit of analysis (country). China (12.1) published 1,064 articles on acupuncture (6.84 percentof the total on non-Western medicine), 1,374 on Chinese-Traditional + Oriental-Traditional (C12.20; 8.83%), and 1,969 (12.65%) of the articles on Drugs, Chinese-Herbal. The United States published 1,000 (6.43%) on acupuncture and 724 (4.65%) on Medicine, Traditional. The USSR accounted for 748 (4.81%) of the articles on acupuncture but no other country published more than 700 (4.5%) articles in any one category. Nevertheless, subtotals reveal that the majority of articles were published in China (5,304/34.09%), The United States (2,737/17.59%), England (1,645/10.57%), Japan (928/5.96%), the now dismantled U.S.S.R. (892/5.73%), and The Netherlands (379/2.44%). It should be pointed out that Elsevier, the world's major scientific publisher, is located in Amsterdam and that a more valid way of evaluating country of publication would be to eliminate all commercially published titles and focus only on society journals and journals affiliated with research entities.

A sort by year of publication and country of publication (Table 14) revealed that except for 1 article published in China and received by MEDLINE in 1968 no articles from China appear until 1973 at which time 21 were published. Both England and the United States published a handful of articles prior to 1972 at which time both countries begin to publish on the subject (Figures 17 and 18). The U.S. published 6 articles in 1971 and 50 in 1972 followed by 102 in 1973. England produced 2 in

Figure 11: Non-Western Medicine
English (1966-1993)

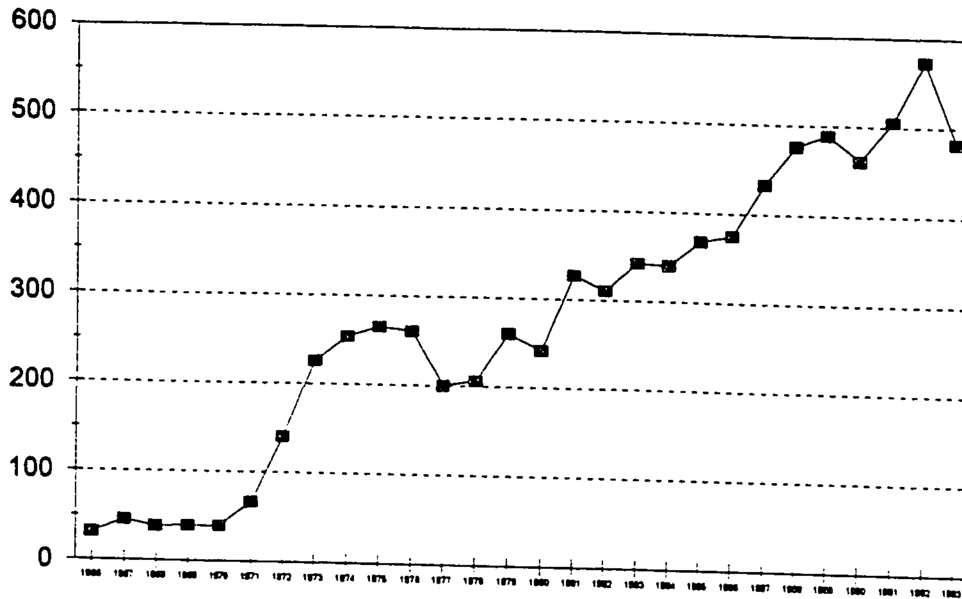


Figure 12: Non-Western Medicine
Chinese (1966-1993)

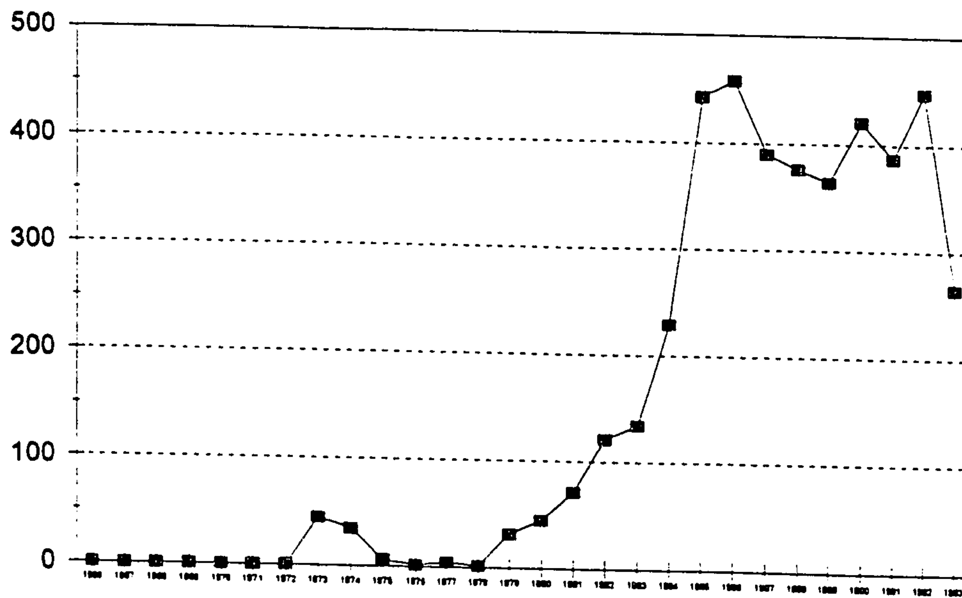


Figure 13: Non-Western Medicine
French (1966-1993)

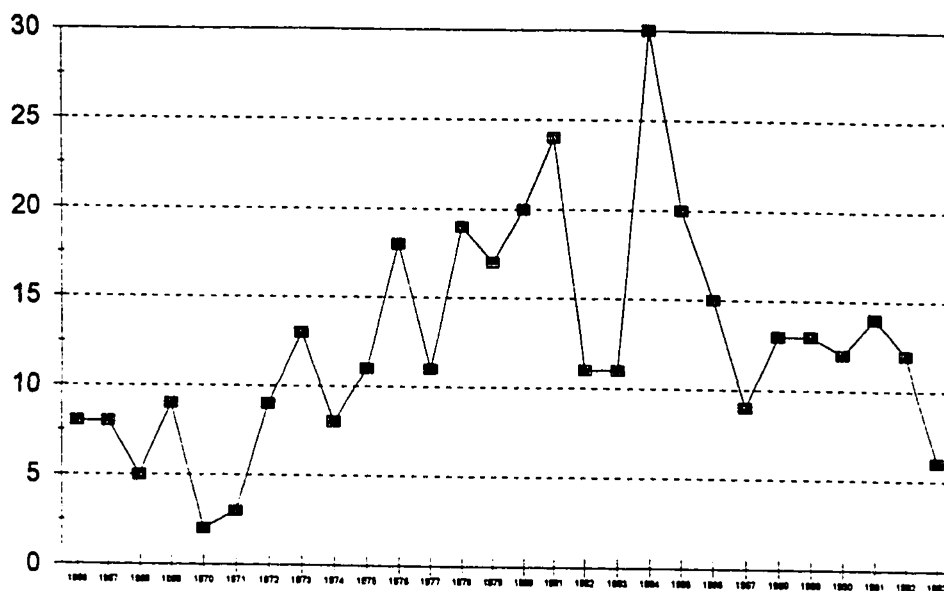


Figure 14: Non-Western Medicine
German (1966-1993)

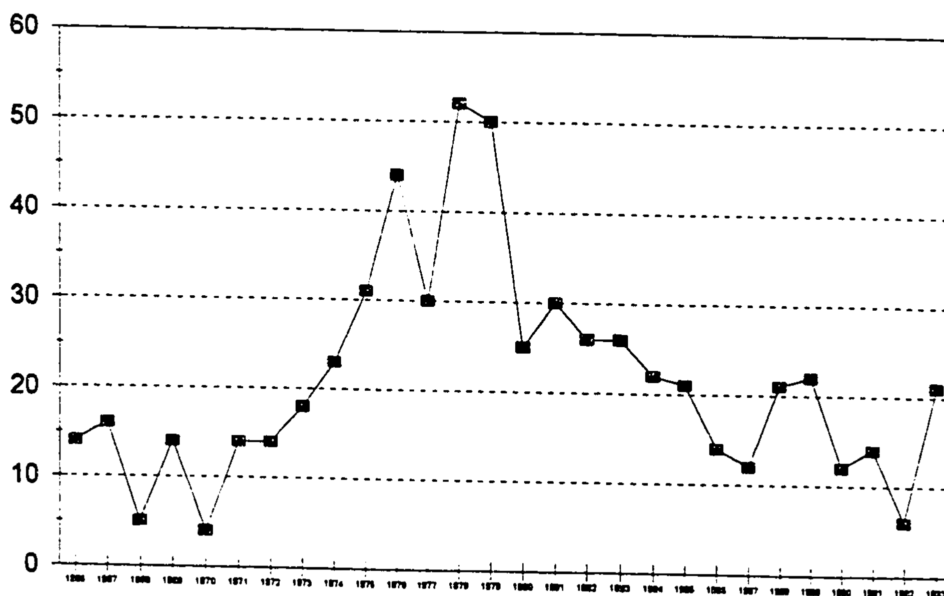


Figure 15: Non-Western Medicine
Japanese (1966-1993)

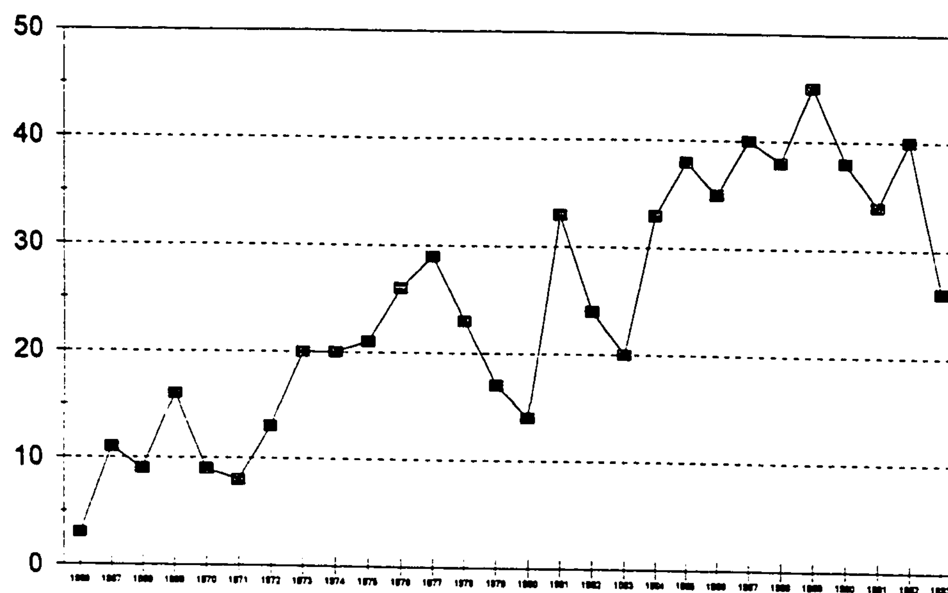
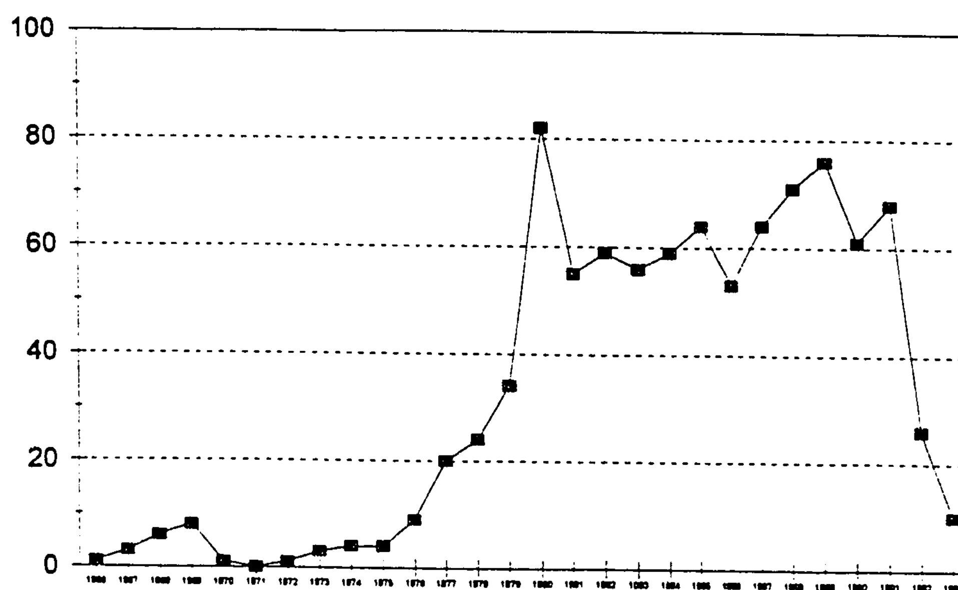


Figure 16: Non-Western Medicine
Russian (1966-1993)



1971, 11 in 1972 and 24 in 1973. The impact, therefore, of an external event such as Reston's operation and American diplomatic and scientific exchanges with a previously closed society cannot be denied. Figures 17 and 19 illustrate the sharp contrast between the output of U.S. scientists compared to Chinese scientists. The figures illustrate that the U.S. was the leader at first; but China has produced slightly more than double the number of articles overall with the major difference being in the area of Medicine, Oriental-Traditional. Although overall interest in the U.S. dropped after 1975 it begins to rise again in 1991. Total output by all countries, however, indicates steady growth after the initial period of exponential growth attributed to U.S. output from 1972 - 1974.

Graphs of research output from India (Figure 20) and Japan (Figure 21) reveal that these countries did not publish before the U.S. nor before France (Figure 22) or Germany (Figure 23) but they did publish, as did the others, before the U.S.S.R. (Figure 24).

PH1 (Articles on non-Western medicine first appear in non-Western journals and gradually begin to appear in Western journals) and H15 (Journals published in countries outside of Europe and the United States publish articles on non-Western medicine for several years before such articles are published in the West) are, therefore, not confirmed - the opposite appears to be the case.

PRQ 4: Is English the dominant language?

2,538 of the articles on acupuncture, 883 of the articles on Drugs-Chinese Herbal, and 2,146 of the articles on Medicine, Traditional were written in English. A subtotal of all the articles in English (7,830) converts to 50.32 percent of the total, far more than Chinese (4,268/27.42 percent) or any other one language.

Figure 17: Non-Western Medicine
U.S.A. (1966-1993)

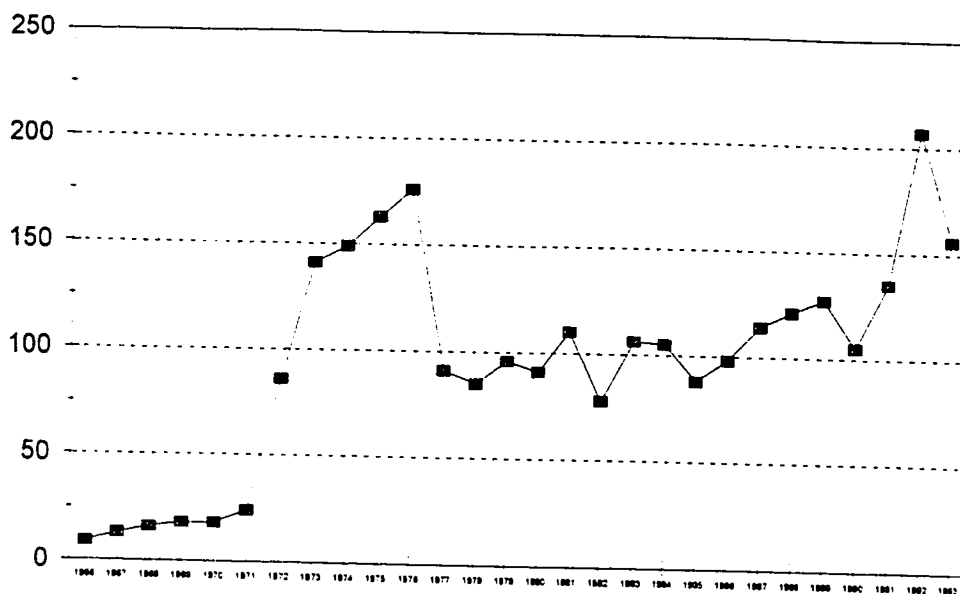


Figure 18 : Non-Western Medicine
England (1966-1993)

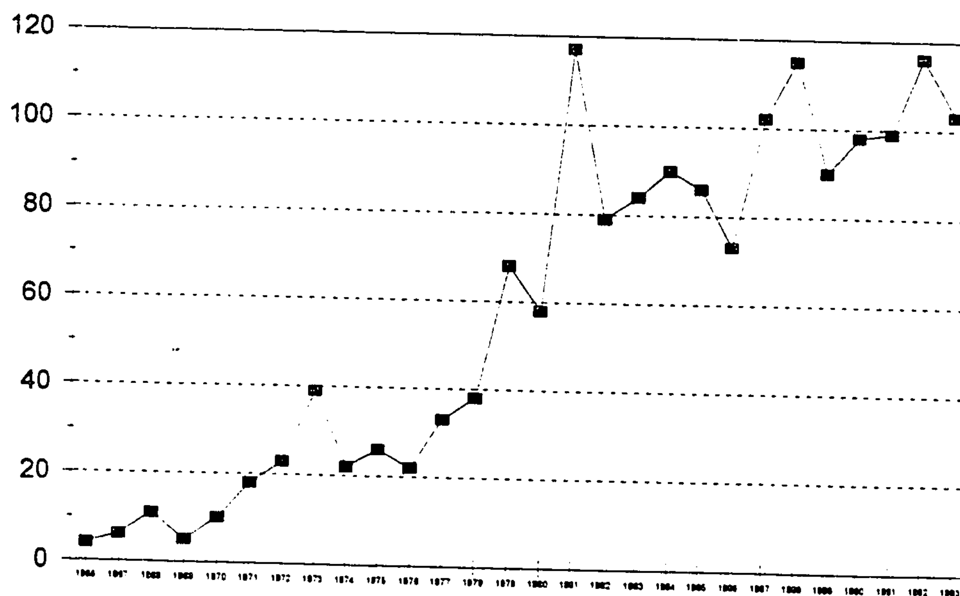


Figure 19: Non-Western Medicine
People's Rep. of China (1966-1993)

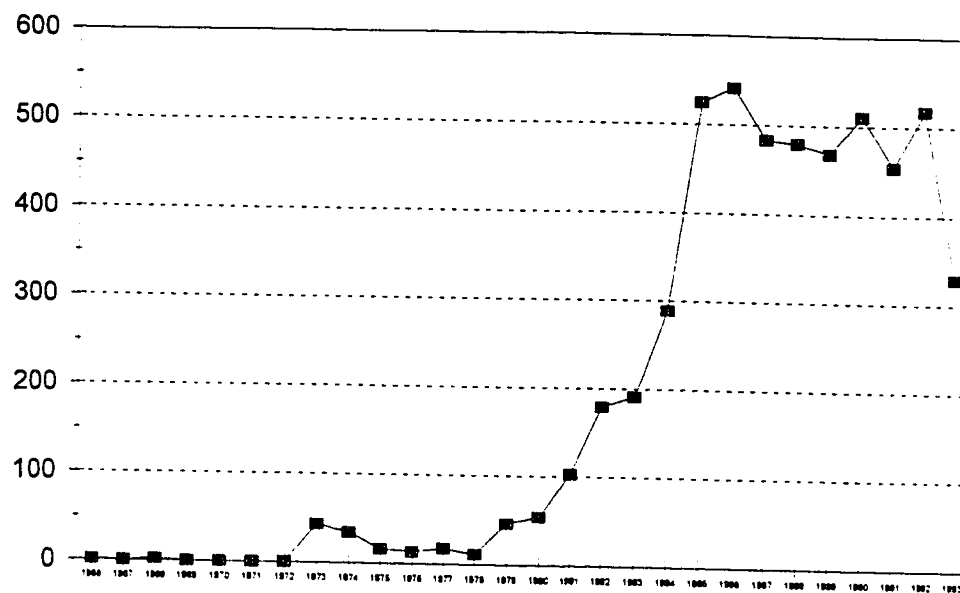


Figure 20: Non-Western Medicine
India (1966-1993)

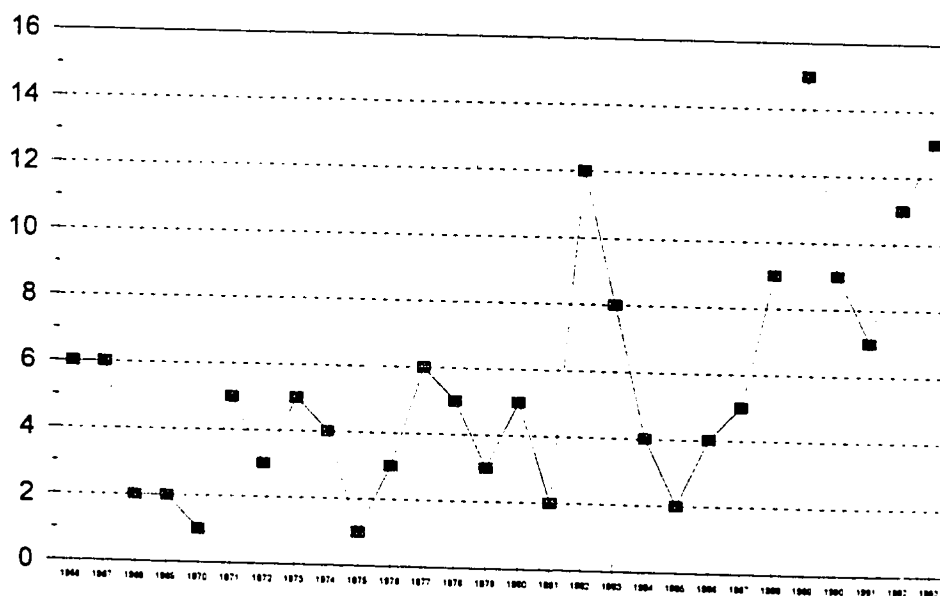


Figure 21: Non-Western Medicine
Japan (1966-1993)

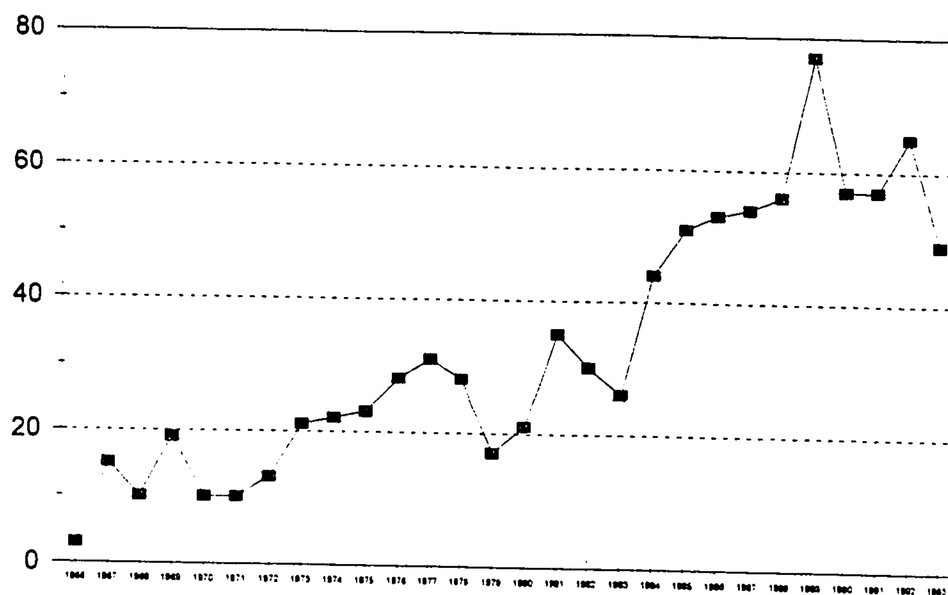


Figure 22: Non-Western Medicine
France (1966-1993)

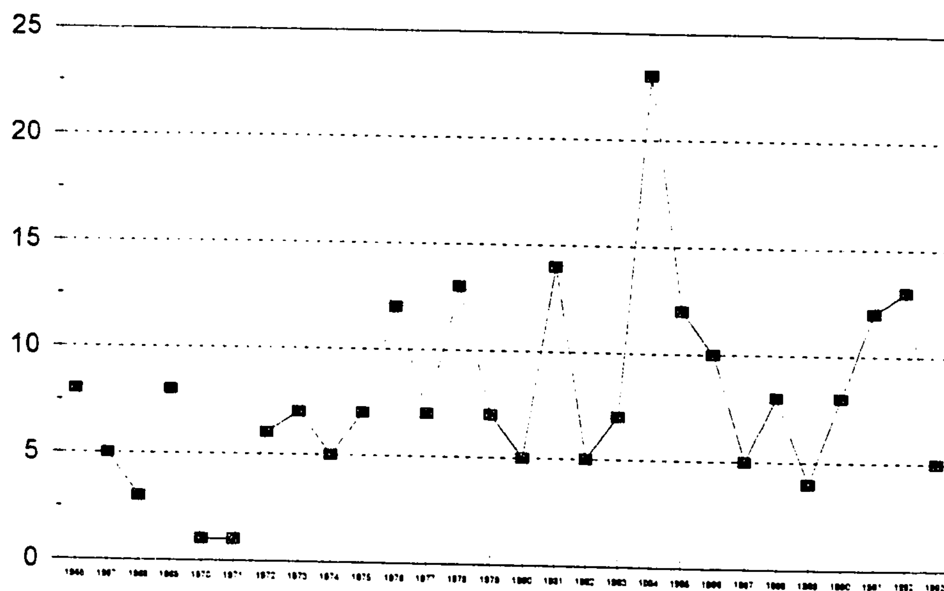


Figure 23: Non-Western Medicine
Germany - East & West (1966-1993)

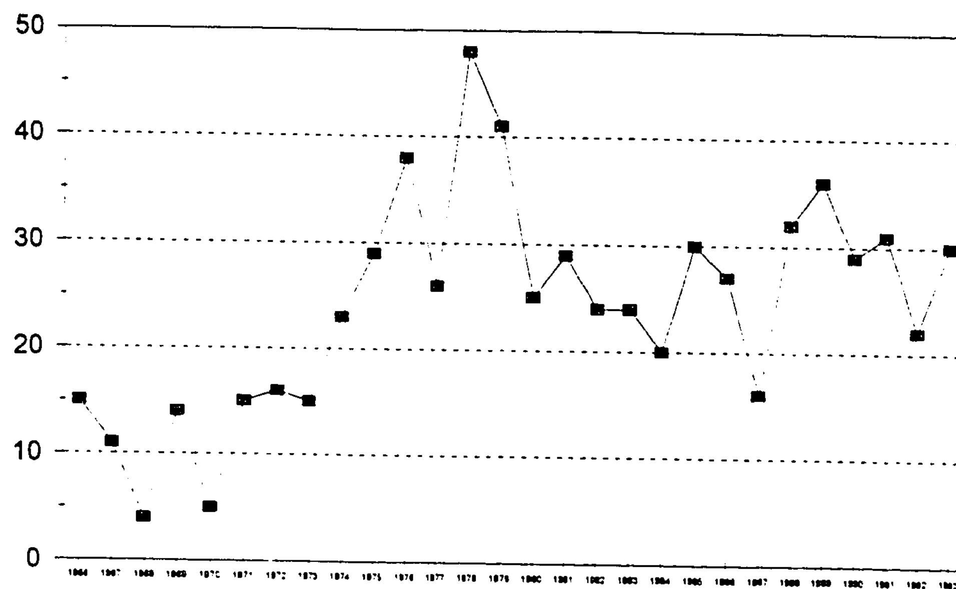
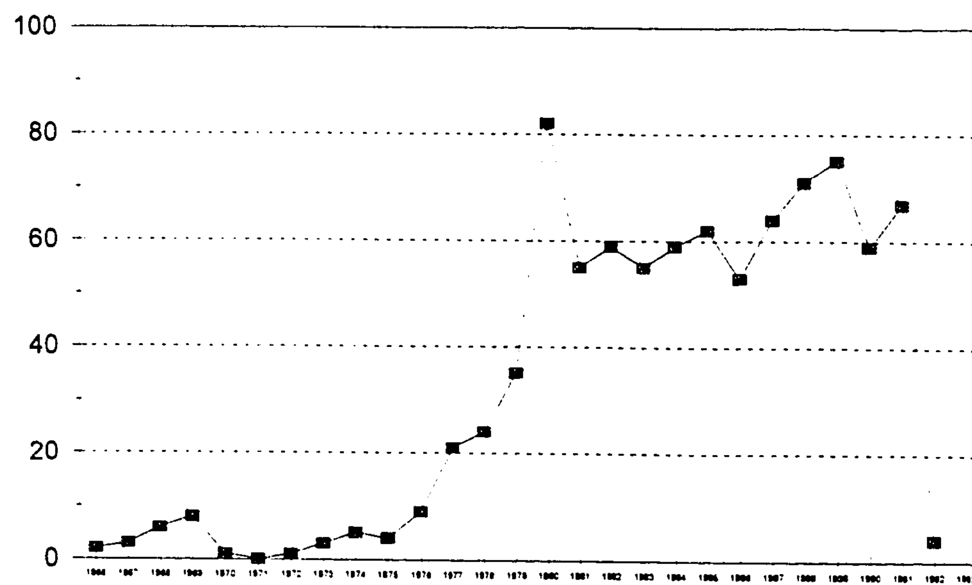


Figure 24: Non-Western Medicine
U.S.S.R. (1966-1993)



PRQ 8: How have the types of articles changed over time? Are there more clinical trials or historical reviews in any given time period for any given topic?

Figures 25 and 26 show that there does appear to be a decline in the number of historical articles as the number of clinical trials appear. There were, however, not enough clinical trials to graph against one another for any topic other than acupuncture. A series of graphs of the number of articles coded by MEDLINE under the category Publication Type - Journal Article, Historical Article, Review, Clinical Trial was generated from Table 12. A comparison of figures 27, 28, 29 and 30 provides strong support for H11 - early work on acupuncture was descriptive. There were no clinical trials prior to 1973 (PRQ10). A few historical articles and reviews were published prior to 1972 at which time the number of historical articles increased 5 times and continued increasing until the clinical trials appeared. As the years passed the number of historical articles decreased as the number of clinical trials increased. Monographs only appear from 1975 - 1978 although when graphed against the number of clinical trials (on screen) there is enough of a pattern to confirm hypotheses about types of publications for part of the sample frame.

PRQ 9: Were there more general descriptive studies in the 1970s compared with the 1980s?

Nothing in the bibliographic data indicated whether an article was descriptive other than the MESH (Figures 27-30) or not. After consulting Dr. Harry Duran, Ph.D., M.D., Chief Resident of Neurosurgery, University of Albuquerque who said that one cannot necessarily anticipate what the introduction sections of medical articles may contain, it was decided that the only way to answer this question was to retrieve the articles themselves.

Figure 25: Non-Western Medicine
Clinical Trials (1966-1993)

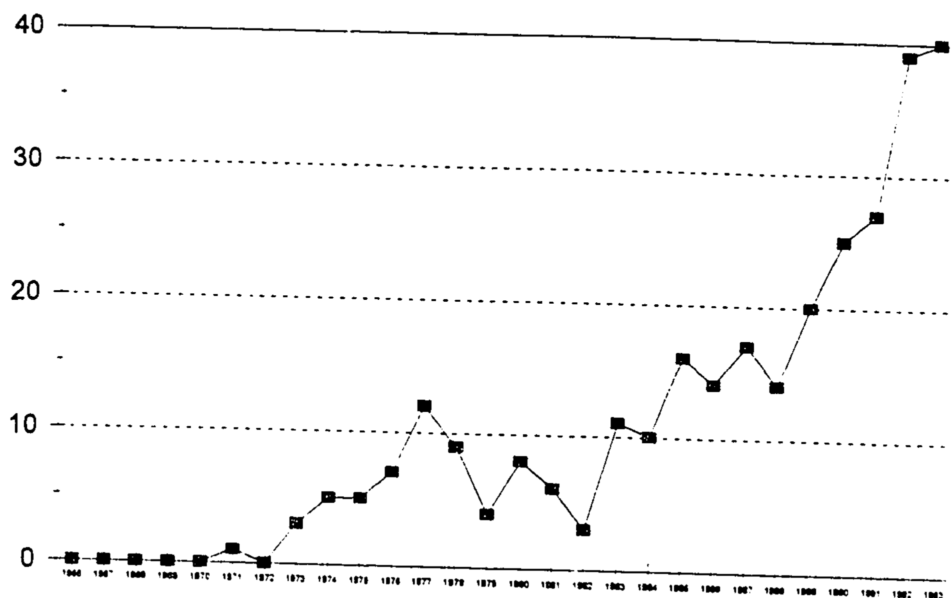


Figure 26: Non-Western Medicine
Historical Articles (1966-1993)

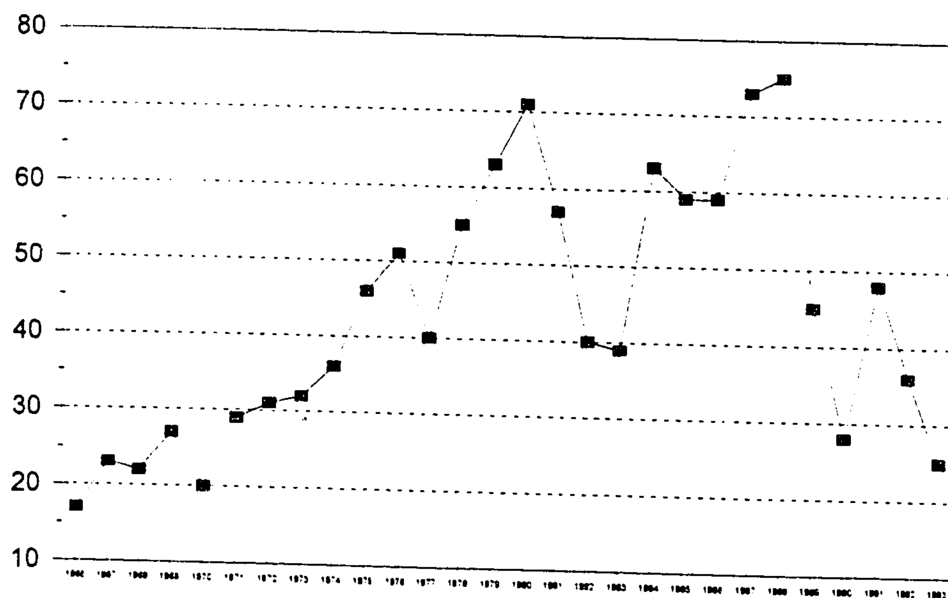


Figure 27: Acupuncture - Journal
(1966-1993)

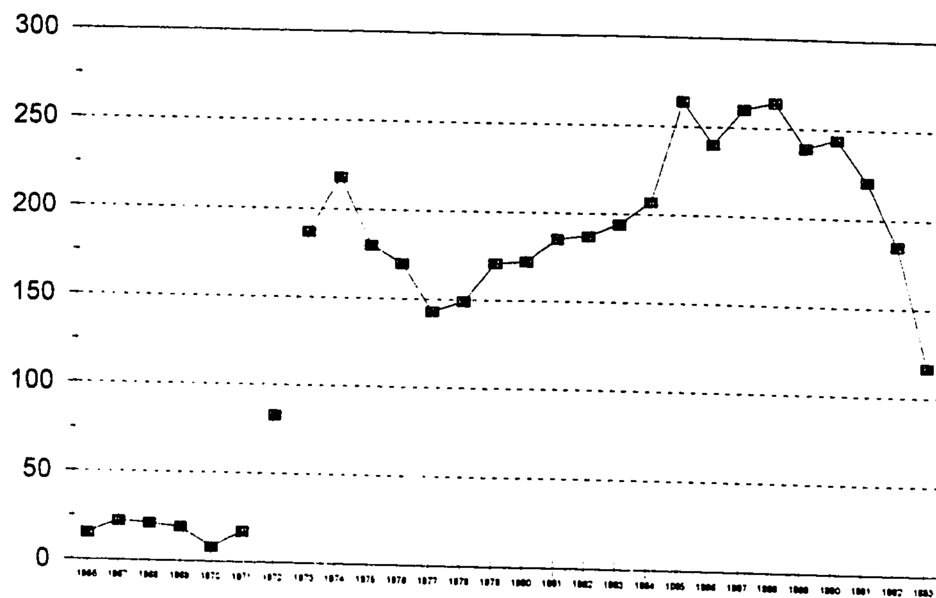


Figure 28: Acupuncture - Historical
(1966-1993)

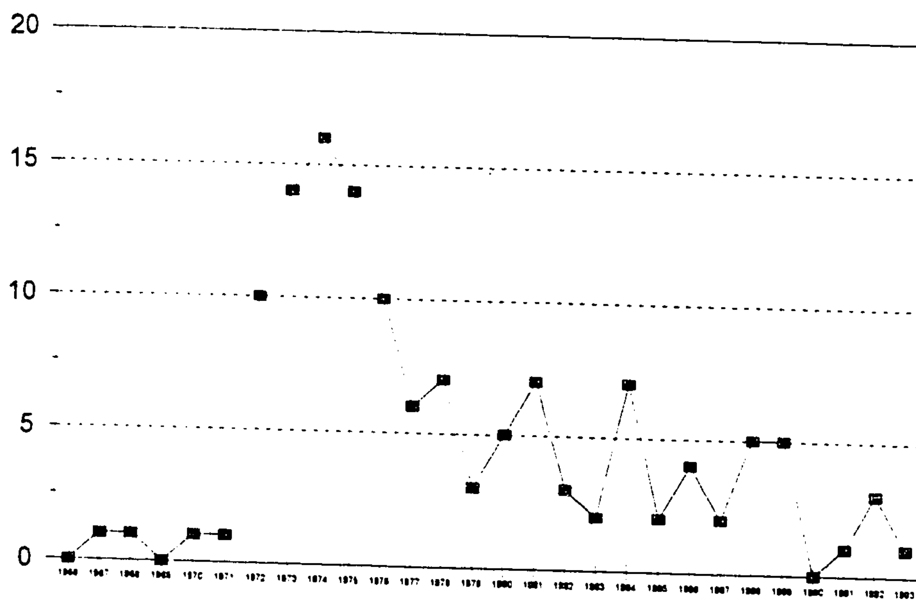


Figure 29: Acupuncture - Review
(1966-1993)

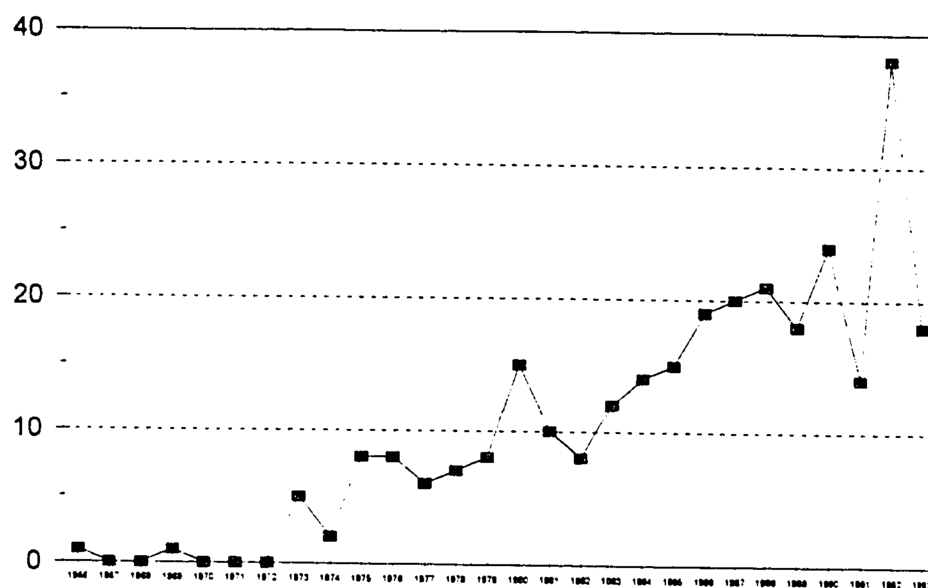
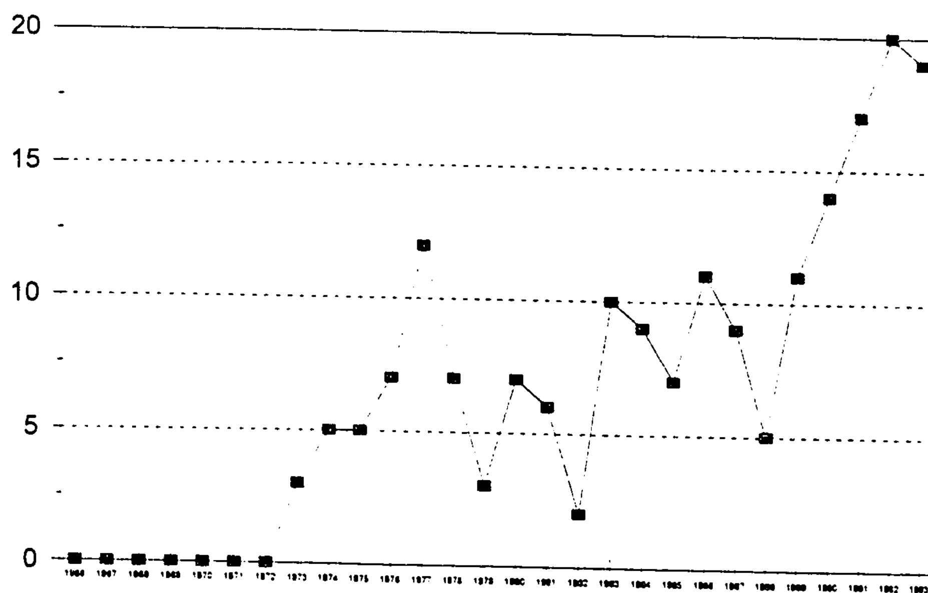


Fig. 30 Acupuncture - Clinical Trials
(1966-1993)



PRQ 10: When do the first clinical trial studies appear?

The first clinical trial appears in 1971 but none was published in 1972. The first set, therefore, appear on the timeline in 1973 and appear regularly each year thereafter on acupuncture only. In 1978 there was one clinical trial coded as Chinese-Traditional/Oriental-Traditional and one on Traditional. By 1979 clinical trials appear scattered across all topics with yearly coverage on Drugs, Chinese-Herbal. Subtotals, not surprisingly, are the most revealing. Out of 15,561 references, there are only 116 on acupuncture, none on African-Traditional, 7 on Ayurveda, 4 on Chinese-Traditional, 7 on Herbal, 3 on Oriental and 1 on Traditional with 19 spread across the "interdisciplinary" topics.

PRQ 11: Is there an increase in the number of articles published in any given language over time?

Although there are 240 articles on Oriental-Traditional published in English, there are 116 in Japanese compared to only 40 in Chinese; in this case the increase appears in Japanese. Only 10 articles were found in Korean in the entire data set. No articles appear in Hindi lending further support for Garg and Dutt's findings. Only 4 articles were published in Arabic with only 4 in Turkish. Therefore, it is not so much whether there is an increase in use of any particular language that was found but the lack of an increase in the languages most expected to be the language of choice of researchers who one would presume would have the linguistic skills to read the primary literature on Arabic medicine, Ayurveda, Tibetan medicine, Korean hand acupuncture, Japanese Kampo and Chinese-Traditional medicine.

PRQ 12: Do topics appear in articles published in languages other than English before they appear in English or vice versa?

The answer to PRQ11 and PRQ12 is that there is an increase in the number of articles in Chinese which raises the question of why did authors begin publishing in Chinese, in 1973, a full year after the publicity surrounding Nixon's visit.

PRQ 13: When do articles in this data set appear on Acquired Immune Disease and do these articles impact on the overall pattern of growth indicating a possible internal or external factor?

AIDS is presumed to be a highly emotionally charged topic that political groups have used to demand funding for medical research for a cure to this particular "plague" as many in the press have reported. All MESH headings were scanned and recoded accordingly. AIDS was originally entered as HIV so all variations were coded as AS and then sorted.

The first articles to appear on AIDS were under Medicine, Traditional and Acquired Immunodeficiency Syndrome [Therapy]; - [Transmission]; - [Epidemiology]; and [Prevention and Control]. The first articles to appear under acupuncture and ; - [Diet Therapy]; and HIV Seropositivity/th [Therapy] were in 1988. HIV [Drug Effects] appears under Drugs, Chinese-Herbal in 1988 and Acquired Immunodeficiency Syndrome [Drug Therapy] first appears under Chinese-Traditional in 1991. HIV [Drug Effects] and - [Prevention & Control] appear in 1992 under Oriental-Traditional. These results are not surprising considering the growth patterns for the 1987-1992 time period.

PH 2: (To be partially tested here)

Specialized journals will begin to appear to provide an outlet for authors whose work is rejected by or not readily accepted by existing journals.

Considering the unexpected size of the data set, (15,561 references), and the

fact that a fairly large number of journals (1,811) were identified, it was not possible within the time allotted to match all the titles with *Ulrich's International Guide to Periodicals* nor guides to serial titles. The *Journal of Ethnopharmacology*, published by Elsevier, and *Acupuncture & Electro-Therapeutics Research: The International Journal*, published by Pergamon, however, stand out from both the paper *Index Medicus* version and from the MEDLINE sorted lists. The *Journal of Ethnopharmacology* is listed as having been launched in 1979. *Ulrich's* lists the journal as "an interdisciplinary journal devoted to bioscientific research on indigenous drugs" publishing articles "concerned with the observation and experimental investigation of the biological activities of plant and animal substances used in the traditional medicine of past and present cultures". Its entry appears in the 1993-1994 edition of *Ulrich's* under the heading "Pharmacology".

Acupuncture & Electro-Therapeutics Research: The International Journal appears under "Alternative Medicine" (Vol. 1, p. 252) of the 1993-1994 edition as having been started in 1976. It is listed as covering "developments in basic and clinical research in acupuncture, electro-therapeutics and related fields" and more importantly from the standpoint of finding supporting evidence for a paradigm change, the journal's mission is to foster "efforts to understand and improve these treatments and their use in diagnosis, prognosis, treatment and prevention of diseases in both Western and Oriental medicine".

Keeping in mind that the journals listed under "Alternative Medicine" by *Ulrich's* do not need to be indexed by MEDLINE to be included, the listing itself can be used to support the claim that journals on acupuncture, Ayurveda and Chinese-Traditional medicine are of recent origin. For example, of the journals published in

English, the *American Journal of Acupuncture* began in 1972, the *Ayurveda Saukhyam Series* began in 1980, and the *British Journal of Acupuncture* (British Acupuncture Association & Register) began in 1977. In 1990 is founded the *International Journal of Clinical Acupuncture.* No date of founding is given for two of the journals from the Traditional Acupuncture Institute: *Journal of Traditional Acupuncture* and *Quintessence;* but *Meridians* from the same publisher, is listed as having been launched in 1992. Given that all these dates fall after the 1971 "Opening of China" and after the introduction of Ayurveda into America, they can be used to support H9. Other titles undoubtedly exist. Nevertheless, they need to appear in the major library indexes in order for them to receive some sort of validation as organs of scientific communication.

Discussion

Despite the methodological problems encountered, it is possible to state that there has definitely been a sufficient increase in the overall number of articles on non-Western medicine to justify an expanded study. Although there are no significant changes in the growth patterns of Arabic and Ayurveda studies, there is definitely a pattern emerging in the field of acupuncture research, drug research, and possibly traditional medicine. The other areas examined exhibit bursts of activity at different points in time but no regular patterns of growth that would justify combining the counts into a graph of the cumulative growth over time. New journals are appearing in these fields but they are of such recent origin that all one can say at this time is that we are probably witnessing a paradigm change in its early stages and not one that has actually occurred as identified by Crane, Price, Laudan and others.

Table 12

SUBJCODE	PUBLICATION TYPE	1964	1965
P1	Bibliography. Historical Article. Historical Biography. Journal Article.		
P1.1	AY		
P1.2	CH		
P1.3	OT		
P1.4	TR		
P2	Bibliography. Historical Article. Journal Article.		
P2.1	CH		
P3	Bibliography. Journal Article.		
P3.1	AC		
P3.2	HB		
P3.3	HB,TR		
P3.4	OT		
P4	Classical Article. Current Biog-Obit. Historical Article. Journal Article.		
P4.1	TR		
P5	Clinical Trial. Comment. Letter.		
P5.1	AC		
P6	Clinical Trial. Historical Article. Journal Article.		
P6.1	TR		
P7	Clinical Trial. Journal Article.		
P7.1	AC		
P7.2	AC,CH		
P7.3	AC,TR		
P7.4	AY		
P7.5	AY,HB		
P7.6	CH		
P7.7	CH,DR		
P7.8	CH,DR		
P7.9	CH,OT		
P7.10	DR		
P7.11	HB		
P7.12	HB,OT		
P7.13	OT		
P7.14	TR		
P8	Clinical Trial. Journal Article. Multicenter Study.		
P8.1	AC		
P8.2	DR		
P8.3	HB		
P9	Clinical Trial. Journal Article. Multicenter Study. Randomized. Controlled Trial.		
P9.1	AY		
P9.2	DR		
P10	Clinical Trial. Journal Article. Randomized Controlled Trial.		
P10.1	AC		
P10.2	AC,CH		
P10.3	AC,DR		
P10.4	AY		
P10.5	DR		
P10.6	HB		
P10.7	HB,TR		
P10.8	TR		
P11	Clinical Trial. Journal Article. Review.		
P11.1	AC		
P12	Clinical Trial. Journal Article. Review. Review, Tutorial.		

Table 12

SUBJCODE	PUBLICATION TYPE	1964	1965
P12.1	TR		
P13	Clinical Trial. Letter.		
P13.1	AC		
P13.2	DR		
P14	Clinical Trial. Letter. Randomized Controlled Trial.		
P14.1	AC		
P14.2	DR		
P14.3	TR		
P15	Clinical Trial. Monograph.		
P15.1	AC		
P16	Comment. Editorial.		
P16.1	AF		
P17	Comment. Editorial. Meta-Analysis.		
P17.1	AC		
P18	Comment. Historical Article. Historical Biography. Letter.		
P18.1	AR		
P19	Comment. Historical Article. Letter.		
P19.1	DR		
P20	Comment. Historical Article. Letter.		
P20.1	TR		
P21	Comment. Journal Article.		
P21.1	AC		
P21.2	TR		
P22	Comment. Journal Article. Review. Review, Academic.		
P22.1	TR		
P23	Comment. Letter.		
P23.1	AC		
P23.2	AC,CH		
P23.3	AF		
P23.4	AY		
P23.5	AY,TR		
P23.6	CH		
P23.7	DR		
P23.8	HB		
P23.9	TR		
P24	Comment. Letter. Review. Review of Reported Cases.		
P24.1	AC		
P25	Congress.		
P25.1	AC		
P25.2	AC,DR		
P25.3	AY		
P25.4	CH		
P25.5	DR		
P25.6	TR		
P26	Congress. Editorial.		
P26.1	AC		
P27	Congress. Historical Article.		
P27.1	AC		
P28	Congress. Overall.		
P28.1	AC		
P28.2	TR		
P29	Current Biog-Obit. Editorial. Historical Article.		

Table 12

SUBJCODE	PUBLICATION TYPE	1964	1965
P29.1	CH		
P30	Current Biog-Obit. Historical Article. Journal Article.		
P30.1	AC		
P30.2	AC,CH,OT		
P30.3	AR		
P30.4	AY		
P30.5	CH		
P30.6	CH,OT		
P30.7	DR		
P30.8	HB		
P30.9	HB,TR		
P30.10	OT		
P30.11	TR		
P31	Current Biog-Obit. Historical Article. Letter.		
P31.1	TR		
P32	Directory.		
P32.1	CH		
P33	Editorial.		
P33.1	AC		
P33.2	AC,AY,OT		
P33.3	AC,CH		
P33.4	AC,HB		
P33.5	CH		
P33.6	CH,DR		
P33.7	CH,OT		
P33.8	DR		
P33.9	HB		
P33.10	OT		
P33.11	TR		
P34	Editorial. Historical Article.		
P34.1	AC		
P34.2	HB,TR		
P34.3	TR		
P35	Editorial. Historical Article. Historical Biography.		
P35.1	HB		
P36	Editorial. Review. Review, Tutorial.		
P36.1	HB		
P37	Historical Article.		
P37.1	DR		
P38	Historical Article. Historical Biography. Journal Article.		
P38.1	AC		
P38.2	AC,CH,OT		
P38.3	AC,OT		
P38.4	AR		3
P38.5	AR,TR		
P38.6	AY		
P38.7	AY,OT		
P38.8	CH		
P38.9	CH,OT		
P38.10	DR		
P38.11	HB		
P38.12	HB,TR		

Table 12

SUBJCODE	PUBLICATION TYPE	1964	1965
P38.13	OT		
P38.14	TR		1
P39	Historical Article. Historical Biography. Letter.		
P39.1	AC		
P39.2	AR		
P39.3	AR,AY		
P39.4	AY		
P40	Historical Article. Journal Article.		
P40.1	AC		
P40.2	AC,CH		
P40.3	AC,CH,HB,OT		
P40.4	AC,CH,OT		
P40.5	AC,HB,OT		
P40.6	AC,HB,TR		
P40.7	AC,OT		
P40.8	AC,OT,TR		
P40.9	AC,TR		
P40.10	AF		
P40.11	AF,HB		
P40.12	AR		2
P40.13	AR,AY		
P40.14	AR,AY,CH		
P40.15	AR,AY,OT		
P40.16	AR,AY,OT,TR		
P40.17	AR,CH,OT		
P40.18	AR,HB		
P40.19	AR,HB,TR		
P40.20	AR,OT		1
P40.21	AR,TR		
P40.22	AY		3
P40.23	AY,CH		
P40.24	AY,CH,OT		
P40.25	AY,OT		
P40.26	AY,OT,TR		
P40.27	AY,TR		
P40.28	CH		
P40.29	CH,DR		
P40.30	CH,DR,HB		
P40.31	CH,HB		
P40.32	CH,HB,OT		
P40.33	CH,OT		
P40.34	CH,OT,TR		
P40.35	CH,TR		
P40.36	DR		
P40.37	HB		
P40.38	HB,OT		
P40.39	HB,TR		
P40.40	OT		1
P40.41	OT,TR		
P40.42	TR		4
P41	Historical Article. Journal Article. Review.		
P41.1	AC		

Table 12

SUBJCODE	PUBLICATION TYPE	1964	1965
P41.2	AC,CH,OT		
P41.3	AR		
P41.4	AR,OT		
P41.5	AY		
P41.6	HB		
P41.7	TR		
P42	Historical Article. Journal Article. Review. Review, Academic.		
P42.1	TR		
P43	Historical Article. Journal Article. Review. Review, Tutorial.		
P43.1	AR		
P43.2	DR		
P43.3	DR,HB		
P43.4	HB		
P44	Historical Article. Letter.		
P44.1	AR		
P44.2	HB,TR		
P44.3	TR		
P45	Historical Article. Monograph.		
P45.1	AY		
P45.2	CH		
P45.3	CH,OT		
P45.4	CH,OT,TR		
P45.5	TR		
P46	Interview.		
P46.1	AC		
P46.2	AC,CH,OT		
P46.3	CH		
P46.4	CH,OT		
P46.5	HB,TR		
P46.6	OT		
P46.7	TR		
P47	Journal Article.		
P47.1	AC	1	9
P47.2	AC,AY,OT		
P47.3	AC,AY,TR		
P47.4	AC,CH		
P47.5	AC,CH,DR		
P47.6	AC,CH,HB		
P47.7	AC,CH,HB,OT		
P47.8	AC,CH,OT		
P47.9	AC,DR		
P47.10	AC,HB		
P47.11	AC,HB,OT		
P47.12	AC,HB,TR		
P47.13	AC,OT		
P47.14	AC,TR		
P47.15	AF		
P47.16	AF,HB		
P47.17	AR		
P47.18	AR,AY,OT		
P47.19	AR,AY,OT,TR		
P47.20	AR,HB		

Table 12

SUBJCODE	PUBLICATION TYPE	1964	1965
P47.21	AR,HB,TR		
P47.22	AR,TR		
P47.23	AY		2
P47.24	AY,CH		
P47.25	AY,CH,DR		
P47.26	AY,CH,HB,TR		
P47.27	AY,CH,TR		
P47.28	AY,HB		
P47.29	AY,HB,OT,TR		
P47.30	AY,HB,TR		
P47.31	AY,OT		
P47.32	AY,TR		
P47.33	CH		
P47.34	CH,DR		
P47.35	CH,DR,HB		
P47.36	CH,DR,OT		
P47.37	CH,HB		
P47.38	CH,HB,OT		
P47.39	CH,OT		
P47.40	CH,OT,TR		
P47.41	CH,TR		
P47.42	DR		
P47.43	DR,HB		
P47.44	DR,OT		
P47.45	DR,TR		
P47.46	HB		2
P47.47	HB,OT		
P47.48	HB,TR		
P47.49	OT		5
P47.50	OT,TR		
P47.51	TR		11
P48	Journal Article. Meta-Analysis.		
P48.1	AC		
P49	Journal Article. Multicenter Study.		
P49.1	HB		
P50	Journal Article. Review.		
P50.1	AC		
P50.2	AC,CH		
P50.3	AC,CH,OT		
P50.4	AC,HB,TR		
P50.5	AC,OT		
P50.6	AR		
P50.7	AR,AY		
P50.8	AR,AY,OT,TR		
P50.9	AY		
P50.10	CH		
P50.11	CH,OT		
P50.12	HB		
P50.13	HB,TR		
P50.14	OT		
P50.15	TR		
P51	Journal Article. Review. Review Literature.		

Table 12

SUBJCODE	PUBLICATION TYPE	1964	1965
P51.1	AC		
P51.2	AC,CH		
P51.3	DR		
P51.4	TR		
P52	Journal Article. Review. Review of Reported Cases.		
P52.1	AC		
P52.2	DR		
P52.3	TR		
P53	Journal Article. Review. Review, Academic.		
P53.1	AC		
P53.2	AC,CH		
P53.3	CH		
P53.4	DR		
P53.5	HB		
P53.6	HB,TR		
P53.7	TR		
P54	Journal Article. Review. Review, Multicase.		
P54.1	AC		
P54.2	DR		
P54.3	TR		
P55	Journal Article. Review. Review, Tutorial.		
P55.1	AC		
P55.2	AC,CH,DR		
P55.3	AC,DR		
P55.4	AF		
P55.5	AY		
P55.6	AY,HB		
P55.7	CH		
P55.8	CH,DR		
P55.9	CH,HB		
P55.10	CH,TR		
P55.11	DR		
P55.12	HB		
P55.13	HB,TR		
P55.14	OT		
P55.15	TR		
P56	Legal Brief.		
P56.1	AC		
P57	Letter.		
P57.1	AC		
P57.2	AC,CH		
P57.3	AC,HB		
P57.4	AC,TR		
P57.5	AF		
P57.6	AY		
P57.7	AY,CH,OT		
P57.8	AY,HB		
P57.9	AY,TR		
P57.10	CH		
P57.11	CH,HB,OT		
P57.12	CH,OT		
P57.13	DR		

Table 12

SUBJCODE	PUBLICATION TYPE	1964	1965
P57.14	DR,TR		
P57.15	HB		
P57.16	OT		
P57.17	TR		
P58	Meeting Report.		
P58.1	AC		
P58.2	OT		
P59	Monograph.		
P59.1	AC		
P59.2	AY		
P59.3	AY,TR		
P59.4	CH		
P59.5	CH,OT		
P59.6	CH,OT,TR		
P59.7	CH,TR		
P59.8	OT		
P59.9	TR		
P60	Monograph. Review.		
P60.1	AC		
P61	News.		
P61.1	AC		
P61.2	AC,CH		
P61.3	AY		
P61.4	CH		
P61.5	CH,DR,HB		
P61.6	CH,HB.OT		
P61.7	DR		
P61.8	HB		
P61.9	OT		
P61.10	TR		
P62	Overall.		
P62.1	AC		
SUBTOTALS		1	44
		0.01%	0.28%

SUBJCODE	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
P1												
P1.1												
P1.2												
P1.3								1				
P1.4												
P2												
P2.1												
P3												
P3.1							1	1				
P3.2												
P3.3												
P3.4							1					
P4												
P4.1												
P5												
P5.1												
P6												
P6.1												
P7												
P7.1								3	4	5	4	10
P7.2												
P7.3												
P7.4						1						
P7.5												
P7.6												
P7.7												
P7.8												
P7.9												
P7.10												
P7.11												
P7.12												
P7.13												
P7.14												
P8												
P8.1												
P8.2												
P8.3												
P9												
P9.1												
P9.2												
P10												
P10.1												
P10.2												
P10.3												
P10.4												
P10.5												
P10.6												
P10.7												
P10.8												
P11												
P11.1									1			2
P12												

SUBJCODE	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
P12.1												
P13												
P13.1											1	
P13.2												
P14												
P14.1												
P14.2												
P14.3												
P15												
P15.1											2	
P16												
P16.1												
P17												
P17.1												
P18												
P18.1												
P19												
P19.1												
P20												
P20.1												
P21												
P21.1												
P21.2												
P22												
P22.1												
P23												
P23.1												
P23.2												
P23.3												
P23.4												
P23.5												
P23.6												
P23.7												
P23.8												
P23.9												
P24												
P24.1												
P25												
P25.1	1			1					1			
P25.2												
P25.3									1			
P25.4												
P25.5												
P25.6												
P26												
P26.1												
P27												
P27.1									1			
P28												
P28.1												
P28.2												
P29												

SUBJCODE	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
P29.1												
P30												
P30.1												
P30.2										1		
P30.3												
P30.4						1						
P30.5												
P30.6												
P30.7												
P30.8												
P30.9												
P30.10				1			1					
P30.11							1	1				
P31												
P31.1												
P32												
P32.1												
P33												
P33.1									1			5
P33.2												
P33.3												
P33.4												
P33.5												
P33.6												
P33.7												
P33.8												
P33.9											1	
P33.10												
P33.11											1	1
P34												
P34.1												1
P34.2												
P34.3												
P35												
P35.1												
P36												
P36.1												
P37												
P37.1												
P38												
P38.1			1				2	2	1	2	1	
P38.2												
P38.3												1
P38.4	1	4	1	4	1	5	3	2	3	1	4	2
P38.5												
P38.6			1			1	1					
P38.7												
P38.8												
P38.9												
P38.10												
P38.11	1			1	1	2				1		2
P38.12												

SUBJCODE	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
P38.13			1	3	1		1	2				1
P38.14				1	1			1	1	3	1	
P39												
P39.1												
P39.2												
P39.3												
P39.4												
P40												
P40.1							4	6	10	9	4	3
P40.2									1	1	1	1
P40.3												
P40.4									1	1	2	
P40.5									1			
P40.6										1		
P40.7		1			1		2	6	1		1	
P40.8							1					
P40.9						1	1					
P40.10												
P40.11												
P40.12	4	3	4	6	3	6	5	3	9	1	3	1
P40.13		1				2						2
P40.14												
P40.15				1								
P40.16		1					1					
P40.17												
P40.18												
P40.19												
P40.20												
P40.21										1		
P40.22	1	2	5		2	1	3	2	2	4	9	9
P40.23												
P40.24												
P40.25			1									
P40.26			1									
P40.27							1					
P40.28										1	1	2
P40.29												
P40.30												
P40.31												
P40.32												1
P40.33										3	5	4
P40.34												
P40.35												
P40.36												
P40.37				1		1						
P40.38								1				
P40.39		1		1						1		
P40.40	4	2	1	4	4	4	3	2	2	2	2	1
P40.41				1	1	1		1				
P40.42	6	8	5	4	5	4	3	4	3	13	15	9
P41												
P41.1									1			1

SUBJCODE	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
P41.2											1	
P41.3												
P41.4												
P41.5												
P41.6												
P41.7			1			1				1	1	
P42												
P42.1												
P43												
P43.1												
P43.2												
P43.3												
P43.4												
P44												
P44.1												
P44.2												
P44.3												
P45												
P45.1											1	
P45.2												
P45.3											1	
P45.4											1	
P45.5											1	
P46												
P46.1												
P46.2												
P46.3												
P46.4												
P46.5												
P46.6												
P46.7												
P47												
P47.1	14	19	20	18	8	14	73	158	199	168	156	136
P47.2												
P47.3												
P47.4									2	5	3	2
P47.5												
P47.6									1			
P47.7												
P47.8									1	1	5	3
P47.9												
P47.10											1	
P47.11									1			
P47.12												
P47.13	1	3	1	1		3	10	29	14	4	5	2
P47.14										2		
P47.15												
P47.16												
P47.17		2	1	1	1	1	1	4	3	1		
P47.18			1									
P47.19								1				
P47.20												

SUBJCODE	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
P47.21												
P47.22				1					1			
P47.23	6	10	2	3	3	4	7	11	4	5	3	10
P47.24												
P47.25												
P47.26												
P47.27												
P47.28												
P47.29						1						
P47.30												
P47.31				1			1	1				
P47.32						2	1					
P47.33	1							1	8	8	17	9
P47.34												
P47.35												
P47.36												
P47.37											1	
P47.38										2		1
P47.39									11	18	19	29
P47.40										2		2
P47.41												2
P47.42												
P47.43												
P47.44												
P47.45												
P47.46			2		1	4	1			4	4	1
P47.47				1		1						
P47.48		1				1	3	4	3	2	1	1
P47.49	5	17	12	21	13	16	18	49	27	15	5	6
P47.50	1	1				1	2	1			1	
P47.51	20	25	17	22	18	26	41	38	43	41	57	66
P48												
P48.1												
P49												
P49.1												
P50												
P50.1	1			1				3	2	7	8	6
P50.2										1		
P50.3												
P50.4												
P50.5								1				
P50.6												
P50.7									1			
P50.8												
P50.9				1						1		
P50.10												
P50.11												
P50.12												
P50.13												
P50.14							1	3				
P50.15				1				1			1	
P51												

SUBJCODE	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
P51.1												
P51.2												
P51.3												
P51.4												
P52												
P52.1												
P52.2												
P52.3												
P53												
P53.1												
P53.2												
P53.3												
P53.4												
P53.5												
P53.6												
P53.7												
P54												
P54.1												
P54.2												
P54.3												
P55												
P55.1								1				
P55.2												
P55.3												
P55.4												
P55.5												
P55.6												
P55.7												
P55.8												
P55.9												
P55.10												
P55.11												
P55.12												
P55.13												
P55.14												
P55.15												
P56												
P56.1												
P57												
P57.1											3	10
P57.2												
P57.3												
P57.4											1	
P57.5												
P57.6												1
P57.7												
P57.8												
P57.9												
P57.10												
P57.11												
P57.12												
P57.13												

SUBJCODE	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
P57.14												
P57.15												
P57.16												
P57.17											3	2
P58												
P58.1												
P58.2												
P59												
P59.1										16	14	1
P59.2											1	
P59.3											1	
P59.4											6	
P59.5											11	
P59.6											4	
P59.7											1	
P59.8											2	
P59.9										5	2	
P60												
P60.1											1	
P61												
P61.1												
P61.2												
P61.3												
P61.4												
P61.5												
P61.6												
P61.7												
P61.8												
P61.9												
P61.10												
P62												
P62.1												
SUBTOTALS	67	101	78	101	64	105	194	344	366	360	401	349
	0.43%	0.65%	0.50%	0.65%	0.41%	0.67%	1.25%	2.21%	2.35%	2.31%	2.58%	2.24%

SUBJCODE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
P1												
P1.1							1				1	
P1.2												
P1.3												
P1.4			1									
P2												
P2.1										1		
P3												
P3.1												
P3.2					1							
P3.3								1				
P3.4			1									
P4												
P4.1												
P5												
P5.1												
P6												
P6.1								1				
P7												
P7.1	6	3	6	4	2	8	7	5	11	8	5	5
P7.2						1						
P7.3								1				
P7.4		1	1							1		
P7.5												
P7.6											1	
P7.7												1
P7.8												
P7.9	1				1	1	1	5	3	1		
P7.10										5	1	4
P7.11								2			5	
P7.12											1	
P7.13								1		1		
P7.14	1											
P8												
P8.1												
P8.2												
P8.3											1	
P9												
P9.1												
P9.2												1
P10												
P10.1												5
P10.2												
P10.3												
P10.4												1
P10.5												
P10.6												1
P10.7												
P10.8												
P11												
P11.1				1		1	1	1		1		1
P12												

SUBJCODE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
P12.1												1
P13												
P13.1	1		1	1			1					
P13.2												
P14												
P14.1												
P14.2												
P14.3												
P15												
P15.1												
P16												
P16.1												
P17												
P17.1												
P18												
P18.1												
P19												
P19.1												
P20												
P20.1												
P21												
P21.1												
P21.2												1
P22												
P22.1												
P23												
P23.1												4
P23.2												
P23.3												
P23.4												
P23.5												
P23.6												2
P23.7												2
P23.8												1
P23.9												4
P24												
P24.1												
P25												
P25.1		1			1							
P25.2												
P25.3												
P25.4												
P25.5												
P25.6				2								
P26												
P26.1	1											
P27												
P27.1												
P28												
P28.1												
P28.2												
P29												

SUBJCODE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
P29.1												
P30												
P30.1		1										
P30.2												
P30.3				1								
P30.4												
P30.5											1	
P30.6							1					
P30.7					1							1
P30.8							1					
P30.9					1							
P30.10												
P30.11		1	1	2	2		1					
P31												
P31.1												
P32												
P32.1										1		
P33												
P33.1	2		4	5	1	2	2	1	2	2	2	
P33.2												
P33.3												
P33.4						1						
P33.5		1									1	
P33.6											1	
P33.7		1		1				1				
P33.8												
P33.9		1					1				1	
P33.10	1											
P33.11		2		2		2	1		1	1		
P34												
P34.1												
P34.2								1				
P34.3	1											
P35												
P35.1												
P36												
P36.1												
P37												
P37.1												
P38												
P38.1		1		1	1					1		1
P38.2				1								
P38.3												
P38.4	2	9	34	11	2	7	7	10	6	8	3	3
P38.5				1								
P38.6		1			1	1	1				1	
P38.7				1								
P38.8			1		1		1	1	2	1	3	1
P38.9					1	1	1	2	5	1		
P38.10											1	
P38.11	2	3	1	1	2		2	2	1	2	4	3
P38.12					1							

SUBJCODE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
P38.13			1								1	
P38.14	1		1	1	3	1	4	4	1	6	1	1
P39												
P39.1	1				1							
P39.2	2					1						1
P39.3						1						
P39.4												
P40												
P40.1	4	1	3	2	1	1	3	1	3		3	
P40.2							2	1		1	2	4
P40.3	1											
P40.4	1	1	1	2		1	1		1			
P40.5												
P40.6												
P40.7							1					
P40.8												
P40.9												
P40.10												
P40.11												
P40.12	9	7	5	8	3	5	6	6	10	5	4	2
P40.13	1					1			1			
P40.14		1						1				
P40.15												
P40.16												
P40.17	1											
P40.18							1					
P40.19												
P40.20							1					
P40.21							1	1			3	
P40.22	3	1	2	3	1	1	5	2	1	1	3	2
P40.23												1
P40.24		1						1				
P40.25												
P40.26												
P40.27												
P40.28	1	1	1	1	1	2	3	1	5	10	7	5
P40.29										1	1	1
P40.30										1		
P40.31		1							1			
P40.32					1							
P40.33	2	4	5	4	4	1	8	8	7	6		
P40.34												
P40.35				1						1		
P40.36										1	7	3
P40.37	3	1	8	5	3	2	2	3	3	5	6	3
P40.38												
P40.39		1			3	1		1	1	2	1	1
P40.40	4	2			1	1	1			1		
P40.41												
P40.42	16	27	7	12	6	11	12	13	8	18	22	13
P41												
P41.1			1	1								

SUBJCODE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
P41.2												
P41.3												
P41.4	1											
P41.5								1	1			
P41.6				1	1							
P41.7					2				2			
P42												
P42.1										1		
P43												
P43.1												
P43.2											2	
P43.3												
P43.4												
P44												
P44.1							1				1	
P44.2				1								
P44.3					1							
P45												
P45.1												
P45.2												
P45.3												
P45.4												
P45.5												
P46												
P46.1							3		1	1		
P46.2							2					
P46.3		1										
P46.4							2					
P46.5								1				
P46.6									1			
P46.7			1		2		1			1		1
P47												
P47.1	143	167	164	177	177	184	184	248	216	238	245	233
P47.2						1						
P47.3					1		1					
P47.4	1	2	4	1	2	4	4	4	5	6	11	1
P47.5												1
P47.6												
P47.7				2		1						
P47.8	3	1	3	4	4	1	15	10	15	8		
P47.9										6	6	3
P47.10		1			2	1		2	1	1		
P47.11												1
P47.12					1							
P47.13	1		1			1	2		3		2	
P47.14	1			1		1	1			1		
P47.15												
P47.16												
P47.17	1	1	1	2	1		1	2				
P47.18												
P47.19												
P47.20						1	1					

SUBJCODE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
P47.21								1				
P47.22				1								
P47.23	4	5	3	9	11	11	6	7	9	9	9	14
P47.24									1			
P47.25										1		
P47.26												
P47.27			1	2								
P47.28				1	1			1				1
P47.29												
P47.30				1								
P47.31		2						1				
P47.32			4	3			2		1	1	3	1
P47.33	5	21	16	30	48	26	40	47	85	109	66	74
P47.34					9					4	8	14
P47.35												
P47.36							1					
P47.37		1	1							1		
P47.38		2	1		1	2	5	1	2			
P47.39	16	26	29	78	104	159	238	385	372	87		
P47.40	3		1				1					
P47.41	2		2							1		
P47.42					14	1		2	3	203	351	380
P47.43											2	1
P47.44											2	
P47.45												
P47.46	3	2	19	11	22	20	9	14	14	11	14	17
P47.47					1		1	2			1	2
P47.48	5	6	5	4	2	6	5	3	6	7	1	1
P47.49	9	14	6	13	3	6	12	18	20	15	12	17
P47.50			1			1						
P47.51	65	92	89	141	121	110	98	102	92	100	117	100
P48												
P48.1												
P49												
P49.1												
P50												
P50.1	7	8	15	10	7	11	12	11	16	6		
P50.2					1	1		1	1			
P50.3							1	3	1	1		
P50.4							1					
P50.5												
P50.6												
P50.7												
P50.8												
P50.9									1			
P50.10					1	3		2	1	1		
P50.11		1			2			15	17	3		
P50.12					2		1		1	1		
P50.13								1				
P50.14												
P50.15	1	2	1	2	2	7	2	3	3	1		
P51												

SUBJCODE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
P51.1												
P51.2												
P51.3										1		
P51.4												
P52												
P52.1												1
P52.2												
P52.3												
P53												
P53.1										1	2	
P53.2										1		
P53.3										1		
P53.4										1		1
P53.5												
P53.6												
P53.7										2	1	5
P54												
P54.1										1		
P54.2										1		
P54.3												1
P55												
P55.1									1	10	17	12
P55.2											2	3
P55.3												2
P55.4												
P55.5											1	2
P55.6												
P55.7										1	5	6
P55.8					2					1		2
P55.9												
P55.10										1		
P55.11										9	22	21
P55.12										2	3	2
P55.13										2	3	1
P55.14												1
P55.15		1								5	14	13
P56												
P56.1												
P57												
P57.1	14	7	9	12	9	12	18	18	9	17	14	7
P57.2							2					
P57.3												
P57.4		1										
P57.5												
P57.6				1	1	1		2		2		1
P57.7			1									
P57.8												1
P57.9						1						
P57.10		1								3		
P57.11		3										
P57.12		1				1						
P57.13												4

SUBJCODE	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
P57.14												
P57.15	1	1				2	2	1	1	2	4	2
P57.16			1				1		1	1		
P57.17	7	3	4	4	7	7	3	9	5	10	8	8
P58												
P58.1												
P58.2												
P59												
P59.1	1											
P59.2												
P59.3												
P59.4												
P59.5												
P59.6												
P59.7												
P59.8												
P59.9												
P60												
P60.1												
P61												
P61.1	1		1									
P61.2												
P61.3												
P61.4			1									
P61.5												
P61.6							2					
P61.7												
P61.8			1							1		
P61.9	2											
P61.10		2										
P62												
P62.1												
SUBTOTALS	365	450	472	587	612	638	762	996	981	995	1043	1038
	2.35%	2.89%	3.03%	3.77%	3.93%	4.10%	4.90%	6.40%	6.30%	6.39%	6.70%	6.67%

SUBJCODE	1990	1991	1992	1993	1994	Total	
P1							
P1.1						2	0.01%
P1.2	1					1	0.01%
P1.3						1	0.01%
P1.4						1	0.01%
P2							
P2.1						1	0.01%
P3							
P3.1	1					3	0.02%
P3.2						1	0.01%
P3.3						1	0.01%
P3.4						2	0.01%
P4							
P4.1				1		1	0.01%
P5							
P5.1		1				1	0.01%
P6							
P6.1						1	0.01%
P7							
P7.1	6	5	5	4	0	116	0.75%
P7.2						1	0.01%
P7.3						1	0.01%
P7.4	1		1	1		7	0.04%
P7.5	1					1	0.01%
P7.6			1	2		4	0.03%
P7.7						1	0.01%
P7.8			1			1	0.01%
P7.9						13	0.08%
P7.10	2	3	3	1		19	0.12%
P7.11						7	0.04%
P7.12						1	0.01%
P7.13			1			3	0.02%
P7.14						1	0.01%
P8							
P8.1	1					1	0.01%
P8.2	1		1			2	0.01%
P8.3						1	0.01%
P9							
P9.1		1				1	0.01%
P9.2				1		2	0.01%
P10							
P10.1	7	11	13	13		49	0.31%
P10.2			1			1	0.01%
P10.3			1			1	0.01%
P10.4	1	3		1		6	0.04%
P10.5	1	2	9	13		25	0.16%
P10.6	2	1				4	0.03%
P10.7				1		1	0.01%
P10.8			2			2	0.01%
P11							
P11.1						9	0.06%
P12							

SUBJCODE	1990	1991	1992	1993	1994	Total	
P12.1						1	0.01%
P13							
P13.1						5	0.03%
P13.2				1		1	0.01%
P14							
P14.1				2		2	0.01%
P14.2	1					1	0.01%
P14.3	1					1	0.01%
P15							
P15.1						2	0.01%
P16							
P16.1		1				1	0.01%
P17							
P17.1	1					1	0.01%
P18							
P18.1	1					1	0.01%
P19							
P19.1				1		1	0.01%
P20							
P20.1	1		1			2	0.01%
P21							
P21.1		1		1		2	0.01%
P21.2	1		1			3	0.02%
P22							
P22.1		1				1	0.01%
P23							
P23.1	4	5	8	4		25	0.16%
P23.2				1		1	0.01%
P23.3				3		3	0.02%
P23.4	1	1	10			12	0.08%
P23.5			1			1	0.01%
P23.6		1				3	0.02%
P23.7	3	2	2	6		15	0.10%
P23.8			1			2	0.01%
P23.9	3		4	2		13	0.08%
P24							
P24.1			1			1	0.01%
P25							
P25.1						5	0.03%
P25.2		1				1	0.01%
P25.3						1	0.01%
P25.4			1			1	0.01%
P25.5		1	4	2		7	0.04%
P25.6						2	0.01%
P26							
P26.1						1	0.01%
P27							
P27.1						1	0.01%
P28							
P28.1	1	1		1		3	0.02%
P28.2				1		1	0.01%
P29							

SUBJCODE	1990	1991	1992	1993	1994	Total	
P29.1			1			1	0.01%
P30							
P30.1						1	0.01%
P30.2						1	0.01%
P30.3						1	0.01%
P30.4						1	0.01%
P30.5						1	0.01%
P30.6						1	0.01%
P30.7						2	0.01%
P30.8						1	0.01%
P30.9						1	0.01%
P30.10						2	0.01%
P30.11	1			1		11	0.07%
P31							
P31.1	1					1	0.01%
P32							
P32.1						1	0.01%
P33							
P33.1	1		1			31	0.20%
P33.2			1			1	0.01%
P33.3		1				1	0.01%
P33.4						1	0.01%
P33.5						2	0.01%
P33.6						1	0.01%
P33.7						3	0.02%
P33.8			3			3	0.02%
P33.9				2		6	0.04%
P33.10				1		2	0.01%
P33.11		4	1			16	0.10%
P34							
P34.1						1	0.01%
P34.2						1	0.01%
P34.3		1				2	0.01%
P35							
P35.1		1				1	0.01%
P36							
P36.1			1			1	0.01%
P37							
P37.1			1			1	0.01%
P38							
P38.1						14	0.09%
P38.2						1	0.01%
P38.3						1	0.01%
P38.4	2	8	3	1		150	0.96%
P38.5						1	0.01%
P38.6				1		9	0.06%
P38.7						1	0.01%
P38.8						11	0.07%
P38.9						11	0.07%
P38.10			1			2	0.01%
P38.11	1	3		1		36	0.23%
P38.12						1	0.01%

SUBJCODE	1990	1991	1992	1993	1994	Total	
P38.13						11	0.07%
P38.14	1	6	4	2		46	0.30%
P39							
P39.1						2	0.01%
P39.2	1					5	0.03%
P39.3						1	0.01%
P39.4	1					1	0.01%
P40							
P40.1		1	2	1		62	0.40%
P40.2			1			15	0.10%
P40.3						1	0.01%
P40.4						12	0.08%
P40.5						1	0.01%
P40.6						1	0.01%
P40.7						13	0.08%
P40.8						1	0.01%
P40.9						2	0.01%
P40.10		1				1	0.01%
P40.11				1			
P40.12	3	1	4	2		130	0.84%
P40.13						8	0.05%
P40.14						2	0.01%
P40.15						1	0.01%
P40.16						2	0.01%
P40.17						1	0.01%
P40.18						1	0.01%
P40.19			1			1	0.01%
P40.20						2	0.01%
P40.21						6	0.04%
P40.22	2	3	1	2		76	0.49%
P40.23						1	0.01%
P40.24						2	0.01%
P40.25						1	0.01%
P40.26						1	0.01%
P40.27						1	0.01%
P40.28	4	3	2			51	0.33%
P40.29			1			4	0.03%
P40.30						1	0.01%
P40.31						2	0.01%
P40.32						2	0.01%
P40.33						61	0.39%
P40.34							
P40.35	1					3	0.02%
P40.36	3	5	3	5		27	0.17%
P40.37	1	2	2	1		52	0.33%
P40.38						1	0.01%
P40.39		1	3			18	0.12%
P40.40	1					43	0.28%
P40.41						4	0.03%
P40.42	7	12	5	8		280	1.80%
P41							
P41.1						4	0.03%

SUBJCODE	1990	1991	1992	1993	1994	Total	
P41.2						1	0.01%
P41.3							
P41.4						1	0.01%
P41.5						2	0.01%
P41.6						2	0.01%
P41.7						8	0.05%
P42							
P42.1				1		2	0.01%
P43							
P43.1		1	1			2	0.01%
P43.2						2	0.01%
P43.3		1				1	0.01%
P43.4			1			1	0.01%
P44							
P44.1	1		1			4	0.03%
P44.2						1	0.01%
P44.3	1					2	0.01%
P45							
P45.1						1	0.01%
P45.2							
P45.3						1	0.01%
P45.4						1	0.01%
P45.5						1	0.01%
P46							
P46.1	1					6	0.04%
P46.2						2	0.01%
P46.3						1	0.01%
P46.4						2	0.01%
P46.5						1	0.01%
P46.6						1	0.01%
P46.7			1			7	0.04%
P47							
P47.1	228	210	177	109	1	4094	26.31%
P47.2						1	0.01%
P47.3						2	0.01%
P47.4	10	6	4	3		80	0.51%
P47.5						1	0.01%
P47.6						1	0.01%
P47.7			1			4	0.03%
P47.8						74	0.48%
P47.9	4	3	3	5		30	0.19%
P47.10						9	0.06%
P47.11						2	0.01%
P47.12						1	0.01%
P47.13		1				84	0.54%
P47.14		1				8	0.05%
P47.15		10	16	19		45	0.29%
P47.16		1				1	0.01%
P47.17						24	0.15%
P47.18						1	0.01%
P47.19						1	0.01%
P47.20						2	0.01%

SUBJCODE	1990	1991	1992	1993	1994	Total	
P47.21						1	0.01%
P47.22						3	0.02%
P47.23	11	13	12	8		211	1.36%
P47.24			1			2	0.01%
P47.25						1	0.01%
P47.26		1				1	0.01%
P47.27			1			4	0.03%
P47.28		2	2			8	0.05%
P47.29						1	0.01%
P47.30						1	0.01%
P47.31						6	0.04%
P47.32			1	1		20	0.13%
P47.33	61	57	61	38	1	829	5.33%
P47.34	15	12	8	3		73	0.47%
P47.35			1			1	0.01%
P47.36						1	0.01%
P47.37		1				5	0.03%
P47.38						17	0.11%
P47.39				1		1572	10.10%
P47.40						9	0.06%
P47.41						7	0.04%
P47.42	402	408	473	349	2	2588	16.63%
P47.43	3			1		7	0.04%
P47.44			1			3	0.02%
P47.45		1				1	0.01%
P47.46	23	14	22	12	1	247	1.59%
P47.47						9	0.06%
P47.48	2	1	2	1		73	0.47%
P47.49	8	5	8	11		386	2.48%
P47.50						9	0.06%
P47.51	94	99	83	85	5	2018	12.97%
P48							
P48.1	2					2	0.01%
P49							
P49.1					1	1	0.01%
P50							
P50.1						131	0.84%
P50.2						5	0.03%
P50.3						6	0.04%
P50.4						1	0.01%
P50.5						1	0.01%
P50.6							
P50.7						1	0.01%
P50.8							
P50.9						3	0.02%
P50.10						8	0.05%
P50.11						38	0.24%
P50.12						5	0.03%
P50.13						1	0.01%
P50.14						4	0.03%
P50.15						27	0.17%
P51							

SUBJCODE	1990	1991	1992	1993	1994	Total	
P51.1	1		1	2		4	0.03%
P51.2	1					1	0.01%
P51.3			1	1		3	0.02%
P51.4			1	1		2	0.01%
P52							
P52.1		2	1			4	0.03%
P52.2		1				1	0.01%
P52.3	1					1	0.01%
P53							
P53.1	1		3			7	0.04%
P53.2						1	0.01%
P53.3	1					2	0.01%
P53.4	1	1	3	1		8	0.05%
P53.5	1					1	0.01%
P53.6			1			1	0.01%
P53.7	3	2	1	2		16	0.10%
P54							
P54.1						1	0.01%
P54.2						1	0.01%
P54.3						1	0.01%
P55							
P55.1	20	11	25	14	1	112	0.72%
P55.2			6	1		12	0.08%
P55.3	1	1	2	1		7	0.04%
P55.4		1		2		3	0.02%
P55.5	1		1			5	0.03%
P55.6		1				1	0.01%
P55.7	5	1	1	3		22	0.14%
P55.8	1	1	2			9	0.06%
P55.9		1				1	0.01%
P55.10						1	0.01%
P55.11	16	31	27	16		142	0.91%
P55.12	1	5	4	2		19	0.12%
P55.13			1			7	0.04%
P55.14		1	2			4	0.03%
P55.15	10	16	6	14		79	0.51%
P56							
P56.1			1			1	0.01%
P57							
P57.1	3	7	9	7	2	187	1.20%
P57.2			1	1		4	0.03%
P57.3				1		1	0.01%
P57.4						2	0.01%
P57.5			1	2		3	0.02%
P57.6	4	2	4	3		22	0.14%
P57.7						1	0.01%
P57.8						1	0.01%
P57.9						1	0.01%
P57.10		1	3		1	9	0.06%
P57.11						3	0.02%
P57.12						2	0.01%
P57.13	3	4	7	5	2	25	0.16%

SUBJCODE	1990	1991	1992	1993	1994	Total	
P57.14		1				1	0.01%
P57.15	4	1	5	5		31	0.20%
P57.16				1		5	0.03%
P57.17	2	4	6	9		101	0.65%
P58							
P58.1		1				1	0.01%
P58.2				1		1	0.01%
P59							
P59.1						32	0.21%
P59.2						1	0.01%
P59.3						1	0.01%
P59.4						6	0.04%
P59.5						11	0.07%
P59.6						4	0.03%
P59.7						1	0.01%
P59.8						2	0.01%
P59.9						7	0.04%
P60							
P60.1						1	0.01%
P61							
P61.1	1			1		4	0.03%
P61.2			1			1	0.01%
P61.3		2				2	0.01%
P61.4					1	2	0.01%
P61.5				1		1	0.01%
P61.6						2	0.01%
P61.7		1				1	0.01%
P61.8						2	0.01%
P61.9			1			3	0.02%
P61.10	2		1			5	0.03%
P62							
P62.1			1			1	0.01%
SUBTOTALS	1024	1043	1126	836	18	15561	100.00%
	6.58%	6.70%	7.24%	5.37%	0.12%	100.00%	

TABLE 13

	LANGUAGE	1964	1965	1966	1967	1968	1969	1970	1971	1972
L01	Afrikaans									
L01.1	AC									1
L01.2	TR									
L02	Arabic									
L02.2	AC						1			
L02.3	AR									
L02.4	AR,AY,OT									
L02.5	AR,AY,OT,TR									
L02.6	TR									
L03	Bulgarian									
L03.1	AC									
L03.2	TR									
L04	Chinese									
L04.1	AC									
L04.2	AC,CH									
L04.3	AC,CH,DR									
L04.4	AC,CH,OT									
L04.5	AC,DR									
L04.6	AC,OT									
L04.7	AY									
L04.8	AY,CH,TR									
L04.9	CH									
L04.10	CH,DR									
L04.11	CH,HB									
L04.12	CH,HB,OT									
L04.13	CH,OT									
L04.14	CH,OT									
L04.15	CH,OT,TR									
L04.16	DR									
L04.17	HB									
L04.18	HB,OT									
L04.19	OT									
L04.20	TR									
L05	Czech									
L05.1	AC			1	1		2	1	3	1
L05.2	AC,CH,OT									
L05.3	AR									
L05.4	AR,AY,CH									
L05.5	AR,TR									
L05.6	AY									
L05.7	DR									
L05.8	HB									
L05.9	OT									1
L05.10	OT,TR									
L05.11	TR									
L06	Danish									
L06.1	AC									
L06.2	AC,CH									
L06.3	AR			1						
L06.4	CH									
L06.5	CH,OT									
L06.6	HB									

TABLE 13

	LANGUAGE	1964	1965	1966	1967	1968	1969	1970	1971	1972
L06.7	TR								2	
L07	Dutch									
L07.1	AC									
L07.2	AC,CH									
L07.3	AR						1	1		
L07.4	AY									
L07.5	AY,TR									
L07.6	CH									
L07.7	DR									
L07.8	HB									
L07.9	OT									
L07.10	TR			1	1					
L08	English									
L08.1	AC		1	1	2	3	1	3	7	60
L08.2	AC,AY,OT									
L08.3	AC,AY,TR									
L08.4	AC,CH									
L08.5	AC,CH,HB									
L08.6	AC,CH,HB,OT									
L08.7	AC,CH,OT									
L08.8	AC,DR									
L08.9	AC,HB									
L08.10	AC,HB,OT									
L08.11	AC,HB,TR									
L08.12	AC,OT			1	2			1	2	10
L08.13	AC,OT,TR									1
L08.14	AC,TR								1	1
L08.15	AF									
L08.16	AF,HB									
L08.17	AR		2	1	2	4	4	3	6	7
L08.18	AR,AY								2	
L08.19	AR,AY,CH									
L08.20	AR,AY,OT						1			
L08.21	AR,AY,OT,TR									1
L08.22	AR,HB									
L08.23	AR,HB,TR									
L08.24	AR,OT		1							
L08.25	AR,TR									
L08.26	AY		3	7	10	7	3	4	8	3
L08.27	AY,CH									
L08.28	AY,CH,DR									
L08.29	AY,CH,HB,TR									
L08.30	AY,CH,OT									
L08.31	AY,CH,TR									
L08.32	AY,HB									
L08.33	AY,HB,OT,TR								1	
L08.34	AY,HB,TR									
L08.35	AY,OT						1			
L08.36	AY,OT,TR									
L08.37	AY,TR								2	2
L08.38	CH			1						
L08.39	CH,DR									

TABLE 13

	LANGUAGE	1964	1965	1966	1967	1968	1969	1970	1971	1972
L08.40	CH,DR,HB									
L08.41	CH,HB									
L08.42	CH,HB,OT									
L08.43	CH,HB,OT									
L08.44	CH,OT									
L08.45	CH,OT									
L08.46	CH,OT,TR									
L08.47	DR									
L08.48	DR,HB									
L08.49	DR,OT									
L08.50	DR,TR									
L08.51	HB		1			1		1	1	1
L08.52	HB,OT						1		1	
L08.53	HB,TR				1		1		1	3
L08.54	OT		4	4	4	4	9	8	8	15
L08.55	OT,TR			1				1	2	1
L08.56	TR		8	15	24	19	18	18	24	35
L09	English, Chinese									
L09.1	AC									
L09.2	AC,CH									
L10	English, French									
L10.1	AY									
L10.2	TR									
L11	English, German									
L11.1	AC									
L11.2	TR									
L12	Finnish									
L12.1	AC									2
L12.2	AY						1			
L12.3	HB					1				
L12.4	OT									
L12.5	TR		1							
L13	French									
L13.1	AC		1	7	5	3	4	1		2
L13.2	AC,CH									
L13.3	AC,CH,HB,OT									
L13.4	AC,CH,OT									
L13.5	AC,DR									
L13.6	AC,OT									1
L13.7	AC,TR									
L13.8	AF									
L13.9	AR		1		1		3			1
L13.10	AR,AY,OT					1				
L13.11	AY									
L13.12	AY,CH,TR									
L13.13	AY,OT									1
L13.14	CH									
L13.15	CH,OT									
L13.16	CH,TR									
L13.17	DR									
L13.18	HB									
L13.19	HB,TR									

TABLE 13

	LANGUAGE	1964	1965	1966	1967	1968	1969	1970	1971	1972
L13.20	OT			1		1	1		1	
L13.21	OT,TR				1					
L13.22	TR		1		1		1	1	2	4
L14	German									
L14.1	AC	1	1	3	2	1	2		2	6
L14.2	AC,CH									
L14.3	AC,CH,HB,OT									
L14.4	AC,CH,OT									
L14.5	AC,OT									
L14.6	AC,TR									
L14.7	AR		1	3	4	1	2	1	5	
L14.8	AR,AY				1					
L14.9	AR,CH,OT									
L14.10	AR,TR						1			
L14.11	AY		1		2	1		1		2
L14.12	AY,OT,TR					1				
L14.13	CH									
L14.14	CH,OT									
L14.15	CH,OT,TR									
L14.16	DR									
L14.17	HB						1		4	
L14.18	HB,TR									
L14.19	OT			1	4		1		2	1
L14.20	OT,TR									1
L14.21	TR		2	7	3	1	7	2	1	4
L15	German, French									
L15.1	AC									
L16	Hebrew									
L16.1	AC									
L16.2	TR									
L17	Hungarian									
L17.1	AC									
L17.2	AR					1				
L17.3	AR,AY									
L17.4	AY					1				
L17.5	CH									
L17.6	CH,OT									
L17.7	HB									
L17.8	OT									1
L17.9	TR					1				
L18	Italian									
L18.1	AC			2	1	1	1		1	3
L18.2	AC,CH									
L18.3	AC,CH,OT									
L18.4	AC,OT						1			1
L18.5	AR				1					
L18.6	AR,AY									
L18.7	AY		1							
L18.8	CH									
L18.9	CH,OT									
L18.10	HB						1			
L18.11	OT							1		1

TABLE 13

	LANGUAGE	1964	1965	1966	1967	1968	1969	1970	1971	1972
L18.12	TR		3				1			1
L19	Japanese									
L19.1	AC				1	1	3			1
L19.2	AY									6
L19.3	CH									
L19.4	CH,DR,HB									
L19.5	CH,HB,OT									
L19.6	CH,OT									
L19.7	CH,OT,TR									
L19.8	DR									
L19.9	DR,HB									
L19.10	DR,OT									
L19.11	HB									
L19.12	OT		1	3	10	8	13	9	8	6
L19.13	TR									
L20	Korean									
L20.1	AC,CH									
L20.2	AC,OT				2	1				
L20.3	TR									
L21	Multilingual									
L21.1	AC									
L22	Norwegian									
L22.1	AC									1
L22.2	AC,CH,OT									
L22.3	AC,OT									
L22.4	AR									
L22.5	HB									
L22.6	OT									
L22.7	TR									
L23	Polish									
L23.1	AC									
L23.2	AC,CH									
L23.3	AC,CH,OT									
L23.4	AC,TR									
L23.5	AR									
L23.6	AR,AY									
L23.7	HB			1				1		
L23.8	OT						2			
L23.9	OT,TR						1			
L23.10	TR		1	1			1	1	1	
L24	Portuguese									
L24.1	AC				7	7				
L24.2	AC,OT									
L24.3	AC,TR									
L24.4	AR									
L24.5	AR,AY,OT,TR				1					
L24.6	HB									
L24.7	HB,TR									
L24.8	OT		1							
L24.9	TR									
L25	Rumanian									
L25.1	AC		1			1	1	2	1	

TABLE 13

	LANGUAGE	1964	1965	1966	1967	1968	1969	1970	1971	1972
L25.2	AC,CH									
L25.3	HB									
L25.4	HB,TR									
L25.5	TR									
L26	Russian									
L26.1	AC		4			4	4	1		1
L26.2	AC,CH,OT									
L26.3	AC,HB									
L26.4	AR		1		1		1			
L26.5	AR,?									
L26.6	AY									
L26.7	AY,CH,DR									
L26.8	CH									
L26.9	CH,TR									
L26.10	DR									
L26.11	HB									
L26.12	HB,TR									
L26.13	OT				1	1	3			
L26.14	TR			1	1	1				
L27	SerboCroatian (Cyrillic)									
L27.1	AC									
L27.2	TR									
L28	SerboCroatian (Roman)									
L28.1	AC									
L28.2	OT									
L29	Slovak									
L29.1	AC		1				1			1
L29.2	AC,OT									
L29.3	AR									
L29.4	DR									
L29.5	HB									
L29.6	TR									
L30	Spanish									
L30.1	AC			1						1
L30.2	AR								1	1
L30.3	AR,HB,TR									
L30.4	AR,TR									
L30.5	AY									
L30.6	AY,CH									
L30.7	DR									
L30.8	HB		1						2	
L30.9	HB,TR				1					
L30.10	OT								1	
L30.11	TR			1	3	1		1	1	1
L31	Spanish, Latin									
L31.1	HB									
L32	Swedish									
L32.1	AC									
L32.2	AR									
L32.3	CH									
L32.4	CH,TR									
L32.5	HB									

TABLE 13

	LANGUAGE	1964	1965	1966	1967	1968	1969	1970	1971	1972
L32.6	OT									
L32.7	TR							1		
L33	Turkish									
L33.1	AC,CH,OT									
L33.2	AC,HB									
L33.3	AC,OT								1	
L33.4	AY									
L34	Ukranian									
L34.1	AC			1						
L34.2	HB									
L34.3	TR									
		1	44	67	101	78	101	64	105	194
		0.01%	0.28%	0.43%	0.65%	0.50%	0.65%	0.41%	0.67%	1.25%

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
L01												
L01.1					1							
L01.2							1		1	1		
L02												
L02.2												
L02.3												
L02.4												
L02.5												
L02.6												
L03												
L03.1										1	1	1
L03.2					2						1	
L04												
L04.1	23	8			1		4	10	9	7	10	11
L04.2								3				
L04.3												
L04.4									1		1	6
L04.5												
L04.6		1										
L04.7												
L04.8												
L04.9		3					13	8	14	22	8	19
L04.10												
L04.11							1					
L04.12								1				4
L04.13												1
L04.14		8	6	1	3		11	20	45	91	113	187
L04.15						1						
L04.16												
L04.17								1	1	1		1
L04.18												
L04.19	21	14					2	1				
L04.20									1		2	
L05												
L05.1	1	1	1	4	2	3		3	4	7	2	1
L05.2												1
L05.3		1		1				1	1			
L05.4												
L05.5		1										
L05.6		1			1				1	1		
L05.7												
L05.8												
L05.9					1	1						
L05.10											1	
L05.11	1							1		1		1
L06												
L06.1	5	1	1	1	1	1			2	2		1
L06.2					1			1				
L06.3												
L06.4					1							
L06.5												1
L06.6												

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
L06.7			2		1			1		2		
L07												
L07.1	1	1	1		3	2		2			2	1
L07.2					1							
L07.3												
L07.4												
L07.5												1
L07.6												
L07.7												
L07.8							1					
L07.9			1									
L07.10					1	1			2	1		1
L08												
L08.1	110	165	162	113	92	83	83	83	108	78	113	111
L08.2											1	
L08.3										1		
L08.4		2	6	1	1	1	2			2	4	6
L08.5		1										
L08.6											1	1
L08.7		2	3	4	2	3		3	5	4	1	11
L08.8												
L08.9				1							2	
L08.10		2										
L08.11			1							1		1
L08.12	33	9	2	3	1	1		1				1
L08.13												
L08.14			2	1			1		1			1
L08.15												
L08.16												
L08.17	4	7		2	1	6	5	5	8	4	5	6
L08.18		1				1					1	
L08.19							1					
L08.20												
L08.21	1											
L08.22											1	2
L08.23												
L08.24						1						1
L08.25			1						1			1
L08.26	9	5	5	5	10	4	7	5	10	11	11	13
L08.27												
L08.28												
L08.29												
L08.30							1	1				
L08.31									2			
L08.32									1	1		
L08.33												
L08.34									1			
L08.35	1						2		1			
L08.36												
L08.37				1				4	3		1	1
L08.38	1	3	9	17	4	6	10	6	9	21	18	20
L08.39										11		

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
L08.40												
L08.41				1			1	1				
L08.42			2		1		5			1	2	4
L08.43										1		
L08.44									3	1		
L08.45		3	11	30	16	6	15	9	24	12	42	40
L08.46			2	5	2	1						1
L08.47										15	1	
L08.48												
L08.49												
L08.50												
L08.51			3	4	2	5	4	20	15	27	21	16
L08.52	1									1		1
L08.53	4	2	3	1	1	5	6	4	5	7	6	3
L08.54	24	11	6	6	3	9	9	7	7	3	4	10
L08.55	2			1				1				
L08.56	36	41	47	65	64	74	108	92	123	108	107	89
L09												
L09.1												
L09.2												
L10												
L10.1												
L10.2												
L11												
L11.1									1			
L11.2								1				
L12												
L12.1		1		2	1				1	1		2
L12.2												
L12.3												
L12.4			1									
L12.5									3			
L13												
L13.1	5	2	7	11	6	10	7	3	6	3	6	17
L13.2			1						1			2
L13.3						1						
L13.4							1	1				
L13.5										1		
L13.6		2		1								1
L13.7												
L13.8												
L13.9	2		1	1			2	10	1			2
L13.10												
L13.11									1			
L13.12								1				
L13.13												
L13.14					1							
L13.15					1	1	2					
L13.16				1	2	2		2	1			
L13.17												
L13.18										2		
L13.19		1										

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
L13.20	2	2										
L13.21												
L13.22	4	1	2	4	1	5	5	3	14	5	5	8
L14												
L14.1	7	13	16	31	19	29	34	16	15	14	10	12
L14.2				2							1	
L14.3									2			
L14.4						1			1			
L14.5	2	3		1	2							
L14.6												
L14.7	2	4	1		1	6	7		3	1	4	2
L14.8					1							
L14.9						1						
L14.10												
L14.11			1	1	1		1		1	1	1	
L14.12												
L14.13				1	1					1		1
L14.14			1			2		1				2
L14.15						1						
L14.16												
L14.17			1	1		2		5				
L14.18											1	
L14.19	3		2	2	4	5	1			1	1	
L14.20												
L14.21	4	3	9	5	1	5	7	3	8	8	8	5
L15												
L15.1												
L16												
L16.1				1						1		
L16.2											2	
L17												
L17.1					4	1						2
L17.2		2		1				3	1			
L17.3												
L17.4											1	
L17.5												
L17.6			1									1
L17.7							1		1			
L17.8												
L17.9			1		1		1		1		1	2
L18												
L18.1	1	3	1	15	19	16	19	19	9	13	11	1
L18.2				1								
L18.3				4								
L18.4	1											
L18.5												
L18.6					1							
L18.7					1					1		
L18.8												
L18.9												
L18.10												
L18.11												

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
L18.12				1	3	1				1		
L19												
L19.1	10	16	8	6	4	9	8	2	5	2	3	5
L19.2	4		4	8	7	3		1				
L19.3		2		6	4		1	5	8	7	5	4
L19.4												
L19.5					1							
L19.6			2	5	13	10	5	4	11	8	8	19
L19.7								1				
L19.8												
L19.9												
L19.10												
L19.11											1	
L19.12	6	2	7	1		1	3	1	5		2	3
L19.13									4	7	1	2
L20												
L20.1		1								1	1	
L20.2			2								1	
L20.3												
L21												
L21.1		1										
L22												
L22.1	1	3						1	1	4	1	
L22.2					1							
L22.3												
L22.4												
L22.5												
L22.6												1
L22.7				2	1	1				1		
L23												
L23.1		1	2	1		5	2	3	2	2	5	10
L23.2												
L23.3												1
L23.4						1						
L23.5									2			
L23.6											1	
L23.7					1	1	1	2			1	
L23.8												
L23.9												
L23.10					1		1					1
L24												
L24.1								1				
L24.2												1
L24.3											1	
L24.4												
L24.5												
L24.6												
L24.7								1				
L24.8												
L24.9									1		1	1
L25												
L25.1			1					1		6	6	

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
L25.2												
L25.3												1
L25.4												
L25.5		1									1	
L26												
L26.1	2	2	4	6	19	20	27	58	47	53	49	51
L26.2							1					
L26.3										1		
L26.4	1	1		2		1	3	21	5	1	2	4
L26.5									1			
L26.6		1										
L26.7												
L26.8												
L26.9												
L26.10												
L26.11											1	
L26.12												
L26.13												
L26.14				1	1	3	3	3	2	4	4	4
L27												
L27.1			1									
L27.2									1			
L28												
L28.1		1			2	1			1	1		1
L28.2							1					
L29												
L29.1						1	3	1	1	2		
L29.2				1								
L29.3											1	
L29.4												
L29.5												
L29.6				2								
L30												
L30.1	1				1				1	1		
L30.2			1		1				1		1	1
L30.3												
L30.4												
L30.5												
L30.6												
L30.7												
L30.8						1	1	1		1		
L30.9							1					2
L30.10												
L30.11			2			1	3	1	4	3	4	5
L31												
L31.1												
L32												
L32.1	7	2	2	3			1	1	1	2		4
L32.2						1						
L32.3							1					
L32.4												
L32.5			1						1			

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
L32.6	1								1			
L32.7				2		1	1		1	4	1	3
L33												
L33.1												
L33.2							1					
L33.3												
L33.4											1	
L34												
L34.1							1					
L34.2												
L34.3		1			1							
	344	366	360	401	349	365	450	472	587	612	638	762
	2.21%	2.35%	2.31%	2.58%	2.24%	2.35%	2.89%	3.03%	3.77%	3.93%	4.10%	4.90%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
L01												
L01.1											2	0.01%
L01.2	1				1				1		6	0.04%
L02												0.00%
L02.2											1	0.01%
L02.3	2										2	0.01%
L02.4											0	0.00%
L02.5											0	0.00%
L02.6	1										1	0.01%
L03												0.00%
L03.1		1	2	1			1	1			9	0.06%
L03.2		2	2	1	2						10	0.06%
L04												0.00%
L04.1	66	67	63	62	45	74	43	58	15		576	3.70%
L04.2			2			4		2			11	0.07%
L04.3					1				1		2	0.01%
L04.4	8	6	5								27	0.17%
L04.5			4	1	3	3	3	4	2		20	0.13%
L04.6											1	0.01%
L04.7											0	0.00%
L04.8								1			1	0.01%
L04.9	30	70	89	49	58	52	43	46	19		543	3.49%
L04.10			6	7	12	11	10	11	1		58	0.37%
L04.11											1	0.01%
L04.12											5	0.03%
L04.13											1	0.01%
L04.14	334	313	71						1		1204	7.74%
L04.15											1	0.01%
L04.16	1	1	149	257	245	276	287	325	226		1767	11.36%
L04.17	1						1				6	0.04%
L04.18	1										1	0.01%
L04.19	1		1								40	0.26%
L04.20											3	0.02%
L05												0.00%
L05.1	4	4	3	1		2					52	0.33%
L05.2											1	0.01%
L05.3									1		5	0.03%
L05.4											0	0.00%
L05.5											1	0.01%
L05.6	1										5	0.03%
L05.7								4			4	0.03%
L05.8				1							1	0.01%
L05.9									2		5	0.03%
L05.10											1	0.01%
L05.11		1		1				1	1		8	0.05%
L06												0.00%
L06.1	1	1	4	5	1	3	1		1		32	0.21%
L06.2											2	0.01%
L06.3											1	0.01%
L06.4											1	0.01%
L06.5											1	0.01%
L06.6	1										1	0.01%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
L06.7				1							9	0.06%
L07												0.00%
L07.1			2	3							18	0.12%
L07.2			1								2	0.01%
L07.3											2	0.01%
L07.4						1					1	0.01%
L07.5											1	0.01%
L07.6			1								1	0.01%
L07.7				1					1		2	0.01%
L07.8				1	1						3	0.02%
L07.9											1	0.01%
L07.10			1	1					1		11	0.07%
L08												0.00%
L08.1	123	117	132	124	131	128	134	151	115	4	2538	16.31%
L08.2								1			2	0.01%
L08.3											1	0.01%
L08.4	4	4	4	10	5	7	6	12	3		80	0.51%
L08.5											1	0.01%
L08.6								1			3	0.02%
L08.7	5	10	4								57	0.37%
L08.8			2	5	2	2	2	2	4		19	0.12%
L08.9	2	1							1		7	0.04%
L08.10					1						3	0.02%
L08.11											3	0.02%
L08.12		3		1			1				72	0.46%
L08.13											1	0.01%
L08.14							1				9	0.06%
L08.15							12	17	25		54	0.35%
L08.16							1		1		2	0.01%
L08.17	5	4	9	6	3	5	5	9	1		129	0.83%
L08.18		1									6	0.04%
L08.19	1										2	0.01%
L08.20											1	0.01%
L08.21											2	0.01%
L08.22											3	0.02%
L08.23	1										1	0.01%
L08.24											3	0.02%
L08.25				2							5	0.03%
L08.26	11	10	13	14	18	21	25	28	16		296	1.90%
L08.27		1						1			2	0.01%
L08.28											0	0.00%
L08.29							1				1	0.01%
L08.30	1										3	0.02%
L08.31											2	0.01%
L08.32	1				2	1	3	2			11	0.07%
L08.33											1	0.01%
L08.34											1	0.01%
L08.35	1										6	0.04%
L08.36											0	0.00%
L08.37		1	1	3	1			2	1		23	0.15%
L08.38	18	22	35	32	28	19	16	24	23	3	345	2.22%
L08.39				3	6	5	3	1	2		31	0.20%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
L08.40			1						1		2	0.01%
L08.41		1	1				2				7	0.04%
L08.42		1									16	0.10%
L08.43											1	0.01%
L08.44											4	0.03%
L08.45	58	69	22								357	2.29%
L08.46											11	0.07%
L08.47	1	2	51	94	133	123	140	170	149	4	883	5.67%
L08.48				2	1	3	1				7	0.04%
L08.49				2							2	0.01%
L08.50							2				2	0.01%
L08.51	13	15	19	32	19	28	18	26	18	2	312	2.01%
L08.52	1			2	2						10	0.06%
L08.53	6	6	12	5	2	2		7	2		95	0.61%
L08.54	12	12	9	9	11	6	6	10	10		240	1.54%
L08.55											9	0.06%
L08.56	104	95	118	130	124	111	126	109	110	4	2146	13.79%
L09												0.00%
L09.1				4	1						5	0.03%
L09.2				3							3	0.02%
L10												0.00%
L10.1					1						1	0.01%
L10.2				1							1	0.01%
L11												0.00%
L11.1		1									2	0.01%
L11.2											1	0.01%
L12												0.00%
L12.1			1								11	0.07%
L12.2											1	0.01%
L12.3											1	0.01%
L12.4											1	0.01%
L12.5	1										5	0.03%
L13												0.00%
L13.1	7	6	2	7	2	4	5	2	1		142	0.91%
L13.2	1				1						6	0.04%
L13.3											1	0.01%
L13.4											2	0.01%
L13.5			1								2	0.01%
L13.6											5	0.03%
L13.7	1										1	0.01%
L13.8							1		1		2	0.01%
L13.9	1	1	1				1				29	0.19%
L13.10											1	0.01%
L13.11				1							2	0.01%
L13.12											1	0.01%
L13.13											1	0.01%
L13.14		1							1		3	0.02%
L13.15											4	0.03%
L13.16			1								9	0.06%
L13.17					1		1		1		3	0.02%
L13.18	1	2			3	1		6			15	0.10%
L13.19	1						2				4	0.03%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
L13.20		1	1	1	1	1		1			14	0.09%
L13.21											1	0.01%
L13.22	8	4	3	4	5	6	4	3	2		106	0.68%
L14												0.00%
L14.1	6	4	2	11	8	8	6	5	8		292	1.88%
L14.2				1			1		2		7	0.04%
L14.3											2	0.01%
L14.4											2	0.01%
L14.5											8	0.05%
L14.6			1								1	0.01%
L14.7	2	1		1	3				1		56	0.36%
L14.8											2	0.01%
L14.9											1	0.01%
L14.10											1	0.01%
L14.11		2			1						17	0.11%
L14.12											1	0.01%
L14.13					1						5	0.03%
L14.14		1									7	0.04%
L14.15											1	0.01%
L14.16			1		2		2				5	0.03%
L14.17	3	3	2	1	3		1		2		29	0.19%
L14.18		1									2	0.01%
L14.19	1				1						30	0.19%
L14.20											1	0.01%
L14.21	9	2	6	7	3	4	4	1	8		137	0.88%
L15												0.00%
L15.1						1					1	0.01%
L16												0.00%
L16.1			1		1						4	0.03%
L16.2											2	0.01%
L17												0.00%
L17.1	4		2		1	1		1	2		18	0.12%
L17.2	1	1	1			1					12	0.08%
L17.3											0	0.00%
L17.4											2	0.01%
L17.5							1				1	0.01%
L17.6	1										3	0.02%
L17.7											2	0.01%
L17.8											1	0.01%
L17.9											8	0.05%
L18												0.00%
L18.1	4		1		1	1	4		1		148	0.95%
L18.2											1	0.01%
L18.3											4	0.03%
L18.4											3	0.02%
L18.5	1	1									3	0.02%
L18.6											1	0.01%
L18.7											3	0.02%
L18.8	1		1								2	0.01%
L18.9	1	1									2	0.01%
L18.10											1	0.01%
L18.11		1									3	0.02%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
L18.12			1								12	0.08%
L19												0.00%
L19.1	9	6	7	1	4	2	3	1			117	0.75%
L19.2											33	0.21%
L19.3	2		2	3		1	3				53	0.34%
L19.4								1			1	0.01%
L19.5	1	1									3	0.02%
L19.6	22	20	5								132	0.85%
L19.7											1	0.01%
L19.8			20	30	36	34	28	37	25		210	1.35%
L19.9									1		1	0.01%
L19.10								1			1	0.01%
L19.11											1	0.01%
L19.12	4	8	6	3	5	1					116	0.75%
L19.13				1							15	0.10%
L20												0.00%
L20.1											3	0.02%
L20.2											6	0.04%
L20.3						1					1	0.01%
L21												0.00%
L21.1											1	0.01%
L22												0.00%
L22.1		1				2	1	1	3		20	0.13%
L22.2											1	0.01%
L22.3				1							1	0.01%
L22.4							1				1	0.01%
L22.5									1		1	0.01%
L22.6			1								2	0.01%
L22.7		1	1		1		1			1	10	0.06%
L23												0.00%
L23.1			2		2	1		1	1		40	0.26%
L23.2		1									1	0.01%
L23.3											1	0.01%
L23.4											1	0.01%
L23.5											2	0.01%
L23.6											1	0.01%
L23.7	1		1	2							12	0.08%
L23.8											2	0.01%
L23.9											1	0.01%
L23.10		1	3	3	1						16	0.10%
L24												0.00%
L24.1	1					1					17	0.11%
L24.2											1	0.01%
L24.3											1	0.01%
L24.4											0	0.00%
L24.5											1	0.01%
L24.6												0.00%
L24.7											1	0.01%
L24.8											1	0.01%
L24.9	1	4		1							9	0.06%
L25												0.00%
L25.1	2	1	2	5							30	0.19%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
L25.2	1	1	1	1	2						6	0.04%
L25.3			1				1				3	0.02%
L25.4					1						1	0.01%
L25.5			1	4	2	1					10	0.06%
L26												0.00%
L26.1	53	46	56	62	71	49	55	22	9		775	4.98%
L26.2											1	0.01%
L26.3											1	0.01%
L26.4	5	7	2	1		2	3				64	0.41%
L26.5				1							2	0.01%
L26.6								1			2	0.01%
L26.7			1								1	0.01%
L26.8						1					1	0.01%
L26.9			1								1	0.01%
L26.10				1			1				2	0.01%
L26.11	1				3	2	3	1			11	0.07%
L26.12	1										1	0.01%
L26.13						1		1			7	0.04%
L26.14	4		4	6	2	6	6	1	1		58	0.37%
L27												0.00%
L27.1											1	0.01%
L27.2											1	0.01%
L28												0.00%
L28.1	1	1					1				10	0.06%
L28.2											1	0.01%
L29												0.00%
L29.1		1									12	0.08%
L29.2											1	0.01%
L29.3											1	0.01%
L29.4								2			2	0.01%
L29.5									1		1	0.01%
L29.6											2	0.01%
L30												0.00%
L30.1	3	1	2	1				1			14	0.09%
L30.2	1	1									9	0.06%
L30.3								1			1	0.01%
L30.4	1										1	0.01%
L30.5											0	0.00%
L30.6					1						1	0.01%
L30.7				1							1	0.01%
L30.8				1		1	3		1		13	0.08%
L30.9											4	0.03%
L30.10											1	0.01%
L30.11	3	2	2	2	5		2	1	2		50	0.32%
L31												0.00%
L31.1						1					1	0.01%
L32												0.00%
L32.1	1	1	2	1	1	2	2	3	3		39	0.25%
L32.2											1	0.01%
L32.3					1						2	0.01%
L32.4			1								1	0.01%
L32.5	1							2			5	0.03%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
L32.6	1								2		5	0.03%
L32.7			3		2		1	1	1		22	0.14%
L33												0.00%
L33.1		1									1	0.01%
L33.2											1	0.01%
L33.3											1	0.01%
L33.4											1	0.01%
L34												0.00%
L34.1								1			3	0.02%
L34.2								1			1	0.01%
L34.3							1				3	0.02%
	996	981	995	1043	1038	1024	1043	1126	836	18	15561	100.00%
	6.40%	6.30%	6.39%	6.70%	6.67%	6.58%	6.70%	7.24%	5.37%	0.12%	100.00%	

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C01	Arabia									
C01.1	AR									
C01.2	AR,AY,OT						1			
C01.3	AR,AY,OT,TR				1					
C02	Argentina									
C02.1	AC									
C02.2	HB								1	
C02.3	TR									
C03	Australia									
C03.1	AC								1	2
C03.2	AC,CH,OT									
C03.3	AC,OT			1						1
C03.4	AY									
C03.5	AY,HB									
C03.6	CH									
C03.7	CH,HB,OT									
C03.8	CH,OT									
C03.9	CH,TR									
C03.10	DR									
C03.11	HB									
C03.12	OT						1		1	
C03.13	TR			1	3			1	1	1
C04	Austria									
C04.1	AC									1
C04.2	AC,OT									
C04.3	AY									
C04.4	CH									
C04.5	CH,OT									
C04.6	HB									
C04.7	OT									
C04.8	TR				1			1		
C05	Bangladesh									
C05.1	AY									
C05.2	DR									
C05.3	HB									
C05.4	TR									
C06	Belgium									
C06.1	AC					1				
C06.2	AC,CH									
C06.3	AY		1							
C06.4	CH									
C06.5	HB									
C06.6	OT									
C06.7	TR									
C07	Brazil									
C07.1	AC				7	8				
C07.2	AC,OT									
C07.3	AC,TR									
C07.4	CH									
C07.5	CH,HB									
C07.6	DR									
C07.7	OT		1							

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C07.8	TR									
C08	Bulgaria									
C08.1	AC									
C08.2	HB									
C08.3	TR			1	1					
C09	Byelarus									
C09.1	AC									
C10	Canada									
C10.1	AC				1					2
C10.2	AC,CH									
C10.3	AC,OT									1
C10.4	AR				1					
C10.5	AR,AY,OT					1				
C10.6	AY			1						
C10.7	CH									
C10.8	CH,HB,OT									
C10.9	DR									
C10.10	HB									
C10.11	HB,TR									
C10.12	OT		1							
C10.13	OT,TR							1		
C10.14	TR		1		2			1		
C11	Chile									
C11.1	AC									1
C11.2	HB									
C11.3	TR									
C12	China									
C12.1	AC					1				
C12.2	AC,CH									
C12.3	AC,CH,DR									
C12.4	AC,CH,HB									
C12.5	AC,CH,HB,OT									
C12.6	AC,CH,OT									
C12.7	AC,DR									
C12.8	AC,HB									
C12.9	AC,HB,OT									
C12.10	AC,HB,TR									
C12.11	AC,OT									
C12.12	AC,OT,TR									
C12.13	AC,TR									
C12.14	AY									
C12.15	AY,CH,TR									
C12.16	CH			1						
C12.17	CH,DR									
C12.18	CH,HB									
C12.19	CH,HB,OT									
C12.20	CH,OT									
C12.21	DR									
C12.22	HB									
C12.23	HB,OT									
C12.24	OT		1			1				
C12.25	TR									

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C13	Colombia									
C13.1	TR			1						
C14	Croatia									
C14.1	AC									
C15	Czech Republic									
C15.1	DR									
C15.2	HB									
C15.3	OT									
C16	Czechoslovakia									
C16.1	AC		1	1	1		3	1	3	2
C16.2	AC,CH									
C16.3	AC,CH,OT									
C16.4	AC,OT									
C16.5	AR									
C16.6	AR,AY,CH									
C16.7	AR,TR									
C16.8	AY									
C16.9	CH									
C16.10	CH,OT									
C16.11	DR									
C16.12	HB									
C16.13	OT									1
C16.14	OT,TR									
C16.15	TR									
C17	Denmark									
C17.1	AC									
C17.2	AC,CH									
C17.3	AY		1							
C17.4	CH									
C17.5	CH,OT									
C17.6	DR									
C17.7	HB									
C17.8	OT									
C17.9	TR								2	
C18	Egypt									
C18.1	TR									
C19	England									
C19.1	AC							2	2	10
C19.2	AC,CH									
C19.3	AC,CH,OT									
C19.4	AC,HB									
C19.5	AC,HB,TR									
C19.6	AC,OT									1
C19.7	AC,TR									
C19.8	AF									
C19.9	AR								2	2
C19.10	AR,AY								1	
C19.11	AR,HB,TR									
C19.12	AR,TR									
C19.13	AY			1	3	1	1	1	2	1
C19.14	AY,CH									
C19.15	AY,CH,TR									

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C19.16	AY,HB									
C19.17	AY,HB,TR									
C19.18	AY,OT									
C19.19	AY,TR								2	
C19.20	CH									
C19.21	CH,DR									
C19.22	CH,DR,HB									
C19.23	CH,HB,OT									
C19.24	CH,OT									
C19.25	CH,OT,TR									
C19.26	CH,TR									
C19.27	DR									
C19.28	HB		1					1	1	1
C19.29	HB,OT									
C19.30	HB,TR									2
C19.31	OT					2		2	1	1
C19.32	OT,TR								1	
C19.33	TR		1	3	3	8	4	4	6	5
C20	Ethiopia									
C20.1	AF									
C20.2	TR									
C21	Finland									
C21.1	AC									2
C21.2	AY						1			
C21.3	HB					1				
C21.4	OT									
C21.5	TR		1							
C22	France									
C22.1	AC		1	7	5	2	4	1		2
C22.2	AC,CH									
C22.3	AC,CH,HB,OT									
C22.4	AC,CH,OT									
C22.5	AC,HB									
C22.6	AC,OT									
C22.7	AC,TR									
C22.8	AF									
C22.9	AR						1			
C22.10	AY									
C22.11	CH									
C22.12	CH,OT									
C22.13	DR									
C22.14	HB									
C22.15	HB,TR									
C22.16	OT			1		1	1			
C22.17	TR		1				2		1	4
C23	Germany									
C23.1	AC									
C23.2	AF									
C23.3	AR									
C23.4	AY									
C23.5	CH									
C23.6	DR									

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C23.7	HB									
C23.8	HB,TR									
C23.9	OT									
C23.10	TR									
C24	Germany, East									
C24.1	AC									
C24.2	AC			1					1	
C24.3	AC,TR									
C24.4	AR									
C24.5	HB									
C24.6	OT									
C24.7	OT,TR									1
C24.8	TR			1				1		
C25	Germany, West									
C25.1	AC	1	1	2	2	1	2		1	7
C25.2	AC,CH									
C25.3	AC,CH,HB,OT									
C25.4	AC,CH,OT									
C25.5	AC,OT									
C25.6	AR		1	4	4	1	2	2	5	
C25.7	AR,AY									
C25.8	AR,AY,OT,TR									
C25.9	AR,CH,OT									
C25.10	AR,OT		1							
C25.11	AY				1			1		2
C25.12	AY,OT,TR					1				
C25.13	CH									
C25.14	CH,OT									
C25.15	CH,OT,TR									
C25.16	DR									
C25.17	HB						1		4	
C25.18	HB,OT									
C25.19	HB,TR									
C25.20	OT			1	3		1	1	2	1
C25.21	TR		2	6	1	1	8		2	5
C26	Ghana									
C26.1	AC									
C27	Greece									
C27.1	CH									
C27.2	DR									
C27.3	HB									
C27.4	OT									
C28	Guatemala									
C28.1	HB		1							
C29	Hong Kong									
C29.1	AC									
C29.2	AC,OT									1
C29.3	TR									
C30	Hungary									
C30.1	AC									
C30.2	AR					1				
C30.3	AR,AY								1	

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C30.4	AY									
C30.5	AY,OT					1				
C30.6	AY,TR									
C30.7	CH									
C30.8	CH,OT									
C30.9	DR									
C30.10	HB									
C30.11	HB,TR									
C30.12	OT									1
C30.13	TR					1				
C31	India									
C31.1	AC									
C31.2	AC,AY,TR									
C31.3	AC,CH									
C31.4	AC,OT									
C31.5	AY		2	5	6	1	1	1	4	
C31.6	AY,HB									
C31.7	AY,TR									1
C31.8	CH,OT									
C31.9	DR									
C31.10	HB									
C31.11	HB,TR								1	
C31.12	OT			1			1			2
C31.13	TR					1				
C32	Indonesia									
C32.1	AC		1	1				1		
C33	Ireland									
C33.1	AC									
C33.2	AF									
C33.3	DR									
C33.4	HB									
C33.5	TR									
C34	Israel									
C34.1	AC									
C34.2	AY									1
C34.3	TR									
C35	Italy									
C35.1	AC			2	1	1	1		1	3
C35.2	AC,CH									
C35.3	AC,CH,OT									
C35.4	AC,OT						1			1
C35.5	AR				1					
C35.6	AR,AY									
C35.7	AY		1							
C35.8	CH									
C35.8	CH,OT									
C35.9	DR									
C35.10	HB						1			
C35.11	HB,TR									
C35.12	OT							1		1
C35.13	TR		3				1			1
C36	Jamaica									

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C36.1	HB									
C36.2	HB,TR									
C36.3	TR									
C37	Japan									
C37.1	AC				1	1	3			1
C37.2	AC,CH									
C37.3	AC,OT				2	1				
C37.4	AF									
C37.5	AY								1	6
C37.6	CH									
C37.7	CH,DR									
C37.8	CH,DR,OT									
C37.9	CH,HB,OT									
C37.10	CH,OT									
C37.12	CH,OT,TR									
C37.13	CH,TR									
C37.14	DR									
C37.15	DR,HB									
C37.16	DR,OT									
C37.17	HB									
C37.18	OT		2	3	12	8	16	10	9	6
C37.19	TR									
C38	Kenya									
C38.1	AC									
C38.2	AF									
C38.3	HB									
C38.4	HB,TR									
C38.5	TR			1						
C39	Korea									
C39.1	OT			1			1			
C39.2	TR									
C40	Lebanon									
C40.1	AC									
C40.2	AR		1							
C40.3	AR,TR									
C40.4	HB									
C41	Madagascar									
C41.1	AF									
C42	Malaysia									
C42.1	AC									
C42.2	AY									
C42.3	AY,TR									1
C42.4	CH,OT									
C42.5	DR									
C42.6	TR					1				1
C43	Mexico									
C43.1	AC									
C43.2	AR									
C43.3	AR,HB,TR									
C43.4	HB									
C43.5	HB,TR				1					
C43.6	TR				3	1				

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C44	Netherlands									
C44.1	AC									
C44.2	AC,CH									
C44.3	AF									
C44.4	AR			1			1	1		
C44.5	AY							1		
C44.6	AY,HB									
C44.7	AY,HB,OT,TR								1	
C44.8	AY,TR									
C44.9	CH									
C44.10	CH,HB									
C44.11	CH,OT									
C44.12	DR									
C44.13	DR,HB									
C44.14	HB									
C44.15	HB,OT									
C44.16	HB,TR									
C44.17	OT									
C44.18	TR			2	2		3	2	2	1
C45	New Zealand									
C45.1	AC									1
C45.2	AC,CH,HB									
C45.3	AC,HB,OT									
C45.4	AC,OT				1					
C45.5	AY									
C45.6	CH									
C45.7	CH,DR,HB									
C45.8	CH,HB,OT									
C45.9	HB									
C45.10	HB,OT								1	
C45.11	HB,TR									
C45.12	TR			1						2
C46	Nigeria									
C46.1	AF									
C46.2	HB									
C46.3	HB,TR									
C46.4	TR									
C47	Northern Ireland									
C47.1	AC									
C48	Norway									
C48.1	AC									1
C48.2	AC,CH,OT									
C48.3	AC,OT									
C48.4	AR									
C48.5	HB									
C48.6	OT									
C48.7	TR									
C49	Pakistan									
C49.1	AC									
C49.2	AR									
C49.3	AY									
C49.4	AY,TR									

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C49.5	CH									
C49.6	HB									
C49.7	HB,TR									
C49.8	OT									
C49.9	TR									
C50	Panama									
C50.1	DR									
C50.2	TR									
C51	Papua New Guinea									
C51.1	TR									
C52	Peru									
C52.1	OT								1	
C52.2	TR							1		
C53	Philippines									
C53.1	HB									
C53.2	HB,TR									
C53.3	OT				1					
C53.4	TR									
C54	Poland									
C54.1	AC									
C54.2	AC,CH									
C54.3	AC,CH,OT									
C54.4	AC,TR									
C54.5	AR									
C54.6	AR,AY									
C54.7	HB			1				1		
C54.8	OT						2			
C54.9	OT,TR						1			
C54.10	TR		1	1			1	1	1	
C55	Portugal									
C55.1	AC									
C55.2	HB									
C55.3	HB,TR									
C55.4	TR									
C56	Puerto Rico									
C56.1	TR								1	
C57	Romania									
C57.1	AC		1			1	1	2	1	
C57.2	AC,CH									
C57.3	CH									
C57.4	HB									
C57.5	HB,TR									
C57.6	OT		1	1						
C57.7	TR									
C58	Russia									
C58.1	AC									
C58.2	HB									
C58.3	TR									
C59	Scotland									
C59.1	AC									
C59.2	AR									
C59.3	AY									

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C59.4	CH,OT									
C59.5	DR									
C59.6	HB									
C59.7	OT								1	
C59.8	TR								1	
C60	Senegal									
C60.1	AC									
C60.2	CH,OT									
C60.3	TR									
C61	Singapore									
C61.1	AC									
C61.2	CH									
C61.3	DR									
C61.4	OT					1			1	
C61.5	TR									
C62	South Africa									
C62.1	AC									1
C62.2	AC,TR								1	
C62.3	AF									
C62.4	AR								1	2
C62.5	AY									1
C62.6	CH									
C62.7	HB									
C62.8	HB,TR									
C62.9	TR								2	2
C63	Spain									
C63.1	AC			1						
C63.2	AR								1	1
C63.3	AR,TR									
C63.4	AY									
C63.5	AY,CH									
C63.6	DR									
C63.7	HB								1	
C63.8	TR									
C64	Sri Lanka									
C64.1	AC									1
C64.2	AR									
C64.3	AY				1					
C64.4	TR					1				
C65	Sweden									
C65.1	AC									
C65.2	AC,CH,OT									
C65.3	AC,HB									
C65.4	AC,OT								1	
C65.5	AR									
C65.6	CH									
C65.7	CH,TR									
C65.8	DR									
C65.9	HB									
C65.10	HB,OT									
C65.11	HB,TR									
C65.12	OT									

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C65.13	TR							1		1
C66	Switzerland									
C66.1	AC									
C66.2	AC,CH									
C66.3	AC,CH,OT									
C66.4	AC,HB,OT									
C66.5	AC,OT									1
C66.6	AF									
C66.7	AF,HB									
C66.8	AR									
C66.9	AR,AY				1					
C66.10	AR,HB									
C66.11	AR,OT									
C66.12	AR,TR						1			
C66.13	AY				1	1				
C66.14	AY,CH,HB,TR									
C66.15	AY,CH,TR									
C66.16	AY,HB									
C66.17	AY,OT									1
C66.18	AY,TR									
C66.19	CH									
C66.20	CH,DR									
C66.21	CH,HB									
C66.22	CH,HB,OT									
C66.23	CH,OT									
C66.24	CH,TR									
C66.25	DR									
C66.26	DR,HB									
C66.27	DR,TR									
C66.28	HB									
C66.29	HB,TR				1					
C66.30	OT				1					
C66.31	OT,TR				1					
C66.32	TR				4	1			2	
C67	Syria									
C67.1	AC						1			
C68	Taiwan									
C68.1	AC									
C68.2	AC,CH									
C68.3	CH									
C68.4	CH,OT									
C68.5	CH,OT,TR									
C68.6	DR									
C68.7	HB									
C69	Thailand									
C69.1	AC									
C69.2	AY									
C69.3	CH									
C69.4	DR									
C69.5	OT									
C69.6	TR									1
C70	Tunisia									

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C70.1	AR						2			1
C70.2	TR									
C71	Turkey									
C71.1	AY									
C71.2	TR		1		1					
C72	Uganda									
C72.1	DR									
C72.2	HB									
C72.3	HB,TR									
C72.4	TR				1					
C73	USSR									
C73.1	AC		4	1		4	4	1		1
C73.2	AC,CH									
C73.3	AC,CH,OT									
C73.4	AC,HB									
C73.5	AR		1		1		1			
C73.6	AR,TR									
C73.7	AY									
C73.8	AY,CH,DR									
C73.9	CH									
C73.10	OT				1	1	3			
C73.11	TR			1	1	1				
C74	Ukraine									
C74.1	AC									
C74.2	HB									
C74.3	OT									
C74.4	TR									
C75	United States									
C75.1	AC				1	1	1		4	42
C75.2	AC,AY,OT									
C75.3	AC,CH									
C75.4	AC,CH,DR									
C75.5	AC,CH,HB									
C75.6	AC,CH,HB,OT									
C75.7	AC,CH,OT									
C75.8	AC,DR									
C75.9	AC,HB									
C75.10	AC,HB,OT									
C75.11	AC,HB,TR									
C75.12	AC,OT				1			1	2	6
C75.14	AC,OT,TR									1
C75.15	AC,TR									1
C75.16	AF									
C75.17	AF,HB									
C75.18	AR		2		2	4	4	2	3	3
C75.19	AR,AY									
C75.20	AR,AY,CH									
C75.21	AR,AY,OT,TR									1
C75.22	AR,HB									
C75.23	AR,TR									
C75.24	AY					5	1	1	1	
C75.25	AY,CH,OT									

TABLE 14

	COUNTRY	1964	1965	1966	1967	1968	1969	1970	1971	1972
C75.26	AY,HB									
C75.27	AY,OT						1			
C75.28	AY,TR									
C75.29	CH									
C75.30	CH,DR									
C75.31	CH,DR,HB									
C75.32	CH,HB									
C75.33	CH,HB,OT									
C75.34	CH,OT									
C75.35	CH,OT,TR									
C75.36	CH,TR									
C75.37	DR									
C75.38	DR,OT									
C75.39	DR,TR									
C75.40	HB					1				
C75.41	HB,OT									
C75.42	HB,TR						1			1
C75.43	OT			1	1		3	4	4	12
C75.44	OT,TR			1					1	1
C75.45	TR		5	7	8	5	7	10	9	18
C76	Venezuela									
C76.1	TR									1
C77	Yugoslavia									
C77.1	AC									
C77.2	AR									
C77.3	OT									
C77.4	TR									
C78	Zambia									
C78.1	HB						1			
C78.2	TR									
C79	Zimbabwe									
C79.1	AC									
C79.2	AF									
C79.3	HB									
C79.4	TR				2	2	2	1	1	2
		1	44	67	101	78	101	64	105	194
		0.01%	0.28%	0.43%	0.65%	0.50%	0.65%	0.41%	0.67%	1.25%

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C01												
C01.1										1		
C01.2												
C01.3												
C02												
C02.1									1			
C02.2												
C02.3			1			1		1	1		1	
C03												
C03.1	2	17	8	3	6	7	2		2	1	6	2
C03.2												
C03.3	1					1						
C03.4	1											
C03.5												
C03.6										2		
C03.7			1									
C03.8		1		1	1							
C03.9						1						
C03.10												
C03.11				1			1	1				2
C03.12	1											
C03.13	3	2	2	4	3	3	2	4	2	1	5	2
C04												
C04.1	3	1	2	2	1	2	3	2	1	1	1	
C04.2	1	1										
C04.3												
C04.4												
C04.5			1									
C04.6												
C04.7				1							1	
C04.8	1											
C05												
C05.1							1					
C05.2												
C05.3												
C05.4												
C06												
C06.1		1	2		1	2	1		2	2	2	2
C06.2												
C06.3												
C06.4												
C06.5												
C06.6												
C06.7										1	2	
C07												
C07.1												
C07.2												1
C07.3											1	
C07.4												
C07.5												
C07.6												
C07.7												

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C07.8									1		1	1
C08												
C08.1										1	1	1
C08.2												1
C08.3					2						1	
C09												
C09.1												
C10												
C10.1	4	16	7	6	2	2	2	2	4	3	1	1
C10.2					1	1						
C10.3	3											
C10.4	1											
C10.5												
C10.6												
C10.7						1		1				1
C10.8												
C10.9												
C10.10												
C10.11												
C10.12	3		1				1					
C10.13												
C10.14	1	2		3		3	3	1			2	
C11												
C11.1												
C11.2								1				
C11.3												
C12												
C12.1	21	9	5	2	5	5	15	15	20	18	30	31
C12.2			1	1				3		1		3
C12.3												
C12.4												
C12.5												
C12.6			1	1	2	3		1	3	1	1	14
C12.7												
C12.8												
C12.9												
C12.10												
C12.11		1										
C12.12												
C12.13												
C12.14												
C12.15												
C12.16	1	3	3	2	2	1	14	10	18	35	14	26
C12.17										11		
C12.18							1					
C12.19								1		1	1	3
C12.20		7	6	6	7	1	14	21	60	96	143	211
C12.21										15		
C12.22								1	1	1		1
C12.23												
C12.24	21	14		1	1	1	2	2				
C12.25									1		2	

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C13												
C13.1			1								1	
C14												
C14.1												
C15												
C15.1												
C15.2												
C15.3												
C16												
C16.1	1	1	1	4	2	4	3	4	5	10	3	2
C16.2												
C16.3												1
C16.4				1								
C16.5		1		1				1	1			
C16.6												
C16.7		1										
C16.8		1			1				1	3		1
C16.9												
C16.10												1
C16.11												
C16.12												
C16.13					1	1						
C16.14											1	
C16.15	1			2				1		1		1
C17												
C17.1	5	1	1	3	2	1	2		4	4	1	2
C17.2					1			1				
C17.3												
C17.4					1							
C17.5												1
C17.6												
C17.7												
C17.8												
C17.9			2		1			2		2	1	1
C18												
C18.1							1					
C19												
C19.1	23	9	9	4	12	12	18	17	28	19	32	35
C19.2							1				1	2
C19.3										1		1
C19.4											2	
C19.5			1									
C19.6	1	2		1								1
C19.7			2									1
C19.8												
C19.9	1	1				4	2		4		4	3
C19.10		1									1	
C19.11												
C19.12									1			1
C19.13	1		2	1	2	1	1	3	5		3	1
C19.14												
C19.15									2			

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C19.16												
C19.17									1			
C19.18	1								1			
C19.19								2	2			1
C19.20					1		2	1	2	1	2	1
C19.21												
C19.22												
C19.23							4				1	
C19.24			1	1	1	1	1		3	1		2
C19.25			1		1	1						1
C19.26					1	1						
C19.27												
C19.28			1	3		2	1	4	6	5	5	2
C19.29												
C19.30	2			1		2	1	2	2	4	3	1
C19.31	2	3		1				2		2		2
C19.32	1											
C19.33	7	6	9	10	15	14	37	27	60	46	30	35
C20												
C20.1												
C20.2						2	1					
C21												
C21.1		1		2	3				1	1		2
C21.2												
C21.3												
C21.4	1		1									
C21.5									3			
C22												
C22.1	4		5	8	5	9	6	3	3	1	5	14
C22.2									1			2
C22.3						1						
C22.4							1					
C22.5										1		
C22.6		2		1								
C22.7												
C22.8												
C22.9			1					1				2
C22.10												
C22.11					1	1						
C22.12					1							
C22.13												
C22.14										1		
C22.15												
C22.16	1	2										
C22.17	2	1	1	3		2		1	10	2	2	5
C23												
C23.1												
C23.2												
C23.3										1		1
C23.4												
C23.5												
C23.6												

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C23.7												
C23.8												
C23.9												
C23.10												
C24												
C24.1												
C24.2		2	2				3		4	4		2
C24.3												
C24.4						1						
C24.5												
C24.6												
C24.7												
C24.8				1			1			2		1
C25												
C25.1	4	10	12	30	17	26	21	13	9	8	10	9
C25.2				1								
C25.3									2			
C25.4						1			1			
C25.5	1	2		1	1							
C25.6	3	5	1		1	4	5		3		2	
C25.7					1							
C25.8	1											
C25.9						1						
C25.10						1						
C25.11			2		1		1		2	1	1	
C25.12												
C25.13				1	1					1	2	3
C25.14			1			2	2	2		1	1	1
C25.15						1						
C25.16												
C25.17			1	1		2	1	6				
C25.18												
C25.19		1									1	
C25.20	4		2		3	4	1			1		
C25.21	2	3	8	3	1	5	6	4	8	5	7	3
C26												
C26.1	1											
C27												
C27.1												
C27.2												
C27.3												
C27.4												
C28												
C28.1												
C29												
C29.1			1									
C29.2												
C29.3												
C30												
C30.1					4	1					1	2
C30.2		2		1				3	1			
C30.3												

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C30.4											1	
C30.5												
C30.6									1			
C30.7												
C30.8			1									1
C30.9												
C30.10							1		1			
C30.11												
C30.12												
C30.13			1		1		1		1		1	2
C31												
C31.1	1		1		1		1	1		1	2	1
C31.2										1		
C31.3												
C31.4	1	1										
C31.5	3	2		2	5	1	2	1	1	5	2	1
C31.6												
C31.7												
C31.8		1				1						
C31.9												
C31.10												
C31.11												
C31.12				1								
C31.13						3		3	1	5	4	2
C32												
C32.1											1	
C33												
C33.1												
C33.2												
C33.3												
C33.4												
C33.5											1	
C34												
C34.1				1						1		
C34.2												
C34.3					1					1	2	
C35												
C35.1	2	3	17	16	20	16	20	19	9	13	13	1
C35.2				1								
C35.3				3								
C35.4	1											
C35.5												
C35.6					1							
C35.7					1					1		
C35.8												
C35.8						1						
C35.9												
C35.10										1		
C35.11										1		
C35.12												
C35.13			4	1	3	2				1	2	
C36												

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C36.1												
C36.2												
C36.3										1	1	
C37												
C37.1	9	17	8	8	5	12	8	6	5	3	3	7
C37.2		1								1	1	
C37.3			2								1	
C37.4												
C37.5	4		4	8	7	3		1				1
C37.6		2		6	4		1	5	8	8	6	6
C37.7												
C37.8												1
C37.9					1							1
C37.10			2	5	14	10	5	5	12	8	9	22
C37.12								1				
C37.13												
C37.14												
C37.15												
C37.16												
C37.17										2	1	
C37.18	8	2	7	1		3	3	2	6	1	4	3
C37.19								1	4	7	1	3
C38												
C38.1						1						
C38.2												
C38.3								1	1			
C38.4											1	
C38.5				1			1	1	2	3	1	
C39												
C39.1						1						
C39.2								1				
C40												
C40.1									1			
C40.2	1	4				1			1			1
C40.3			1									
C40.4												
C41												
C41.1												
C42												
C42.1					1	1		2			1	
C42.2												
C42.3												
C42.4		1		1								
C42.5												
C42.6					1	1		1		1		1
C43												
C43.1												
C43.2					1				1			
C43.3												
C43.4						1	1					
C43.5							1					
C43.6							3					1

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C44												
C44.1	2	1	3	7	12	5	8	11	6	7	7	5
C44.2					1							
C44.3												
C44.4							1					
C44.5	1				1				1			2
C44.6										1		
C44.7												
C44.8								1				1
C44.9												
C44.10												
C44.11								1		1		
C44.12												
C44.13												
C44.14							1			1		
C44.15										1		1
C44.16			1			1						
C44.17			1			1						2
C44.18	1	1	3	1	9	4	12	3	8	7	10	6
C45												
C45.1	1		1	3		3	1	1	6	2	3	4
C45.2		1										
C45.3		1										
C45.4				1								
C45.5												
C45.6			1									
C45.7												
C45.8												1
C45.9												
C45.10												
C45.11									1			
C45.12					1	1					1	1
C46												
C46.1												
C46.2												
C46.3						2	3					
C46.4				1		2	1		1			
C47												
C47.1												
C48												
C48.1	1	12							2	7	1	
C48.2					1							
C48.3												
C48.4												
C48.5												
C48.6												1
C48.7				2	1	1				1		
C49												
C49.1			1									
C49.2												1
C49.3												
C49.4												

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C49.5							1					
C49.6												
C49.7												
C49.8								1				
C49.9									3			
C50												
C50.1												
C50.2												1
C51												
C51.1				2		2				2		2
C52												
C52.1												
C52.2												
C53												
C53.1												
C53.2								1				
C53.3												
C53.4			1									
C54												
C54.1		1	3	2		5	2	3	2	2	5	11
C54.2												
C54.3												1
C54.4						1						
C54.5									2			
C54.6											1	
C54.7					1	1	1	2			1	
C54.8												
C54.9												
C54.10					1		1					1
C55												
C55.1								1				
C55.2												
C55.3								1				
C55.4									1			
C56												
C56.1												
C57												
C57.1			1					1		6	6	1
C57.2												
C57.3												
C57.4												1
C57.5												
C57.6												
C57.7		1									1	
C58												
C58.1												
C58.2												
C58.3												
C59												
C59.1	1											
C59.2												
C59.3									1			

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C59.4												
C59.5												
C59.6												
C59.7												
C59.8												
C60												
C60.1							1					
C60.2							1					
C60.3	2	1	1		1		2		2	3	3	4
C61												
C61.1	1											
C61.2												
C61.3												
C61.4	1											
C61.5				1	1	1		2	1	1		
C62												
C62.1	1	2			2				1		1	1
C62.2							1					
C62.3												
C62.4												
C62.5												
C62.6												
C62.7												
C62.8	1											
C62.9	4	5		3	2	9	6	2	3	7	1	1
C63												
C63.1	1				1					1		
C63.2			1								1	1
C63.3												
C63.4												
C63.5												
C63.6												
C63.7										1		1
C63.8									2	3		1
C64												
C64.1			1					1				
C64.2												
C64.3			1				1				1	
C64.4											1	
C65												
C65.1	7	5	3	3	2		1	2	1	2		6
C65.2												
C65.3							1					
C65.4												
C65.5						1						
C65.6							1					
C65.7												
C65.8												
C65.9			1					1	1			
C65.10												
C65.11										1		
C65.12									1			

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C65.13				2		2	1	1	1	4	1	3
C66												
C66.1		1	2	1	1	4	10	2	4	2	1	3
C66.2			1	1							1	
C66.3				1				1				
C66.4		1										
C66.5					1							1
C66.6												
C66.7												
C66.8							1			1	2	
C66.9												
C66.10											1	1
C66.11												1
C66.12												
C66.13		2		1	1			1		2	2	3
C66.14												
C66.15								1				
C66.16									1			
C66.17												
C66.18								1				
C66.19		1									1	
C66.20												
C66.21								1				
C66.22										1		
C66.23							1	1			2	2
C66.24									1			
C66.25												
C66.26												
C66.27												
C66.28								6	3	13	15	4
C66.29		1					1	1	2			1
C66.30			1	1	1	1	3					1
C66.31												
C66.32	1	5	2	2	2	2	18	18	5	5	4	10
C67												
C67.1												
C68												
C68.1	2		1		1			2		1		1
C68.2												
C68.3			1									
C68.4		1	2	2	3		2					
C68.5						1						
C68.6												
C68.7												
C69												
C69.1											1	
C69.2												
C69.3												
C69.4												
C69.5				1				1				
C69.6						1						
C70												

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C70.1	1			1			1	9	1			
C70.2												
C71												
C71.1											1	
C71.2												
C72												
C72.1												
C72.2											1	
C72.3												
C72.4				2	1							
C73												
C73.1	2	2	4	6	19	20	28	58	47	53	49	51
C73.2												
C73.3							1					
C73.4										1		
C73.5	1	1		2		1	3	21	5	1	2	4
C73.6									1			
C73.7		1										
C73.8												
C73.9												
C73.10												
C73.11		1		1	2	3	3	3	2	4	4	4
C74												
C74.1												
C74.2												
C74.3												
C74.4												
C75												
C75.1	75	108	105	83	46	42	33	38	45	25	32	33
C75.2											1	
C75.3		2	5				1			1	3	1
C75.4												
C75.5												
C75.6											1	1
C75.7		2	2	3				2	3	2	1	2
C75.8												
C75.9				1								
C75.10												
C75.11										1		1
C75.12	27	6	2	1	1			1				
C75.14												
C75.15				1					1			
C75.16												
C75.17												
C75.18	1	1		2	1	2	4	5	3	2	1	2
C75.19						1						
C75.20							1					
C75.21												
C75.22												1
C75.23												
C75.24	3	1	1	2	1	2	2		2	2	3	4
C75.25							1	1				

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
C75.26												
C75.27							2					
C75.28				1							1	
C75.29		2	4	15	1	3	6	2	3	4	6	7
C75.30												
C75.31												
C75.32				1			1					
C75.33			1		1		1					2
C75.34			7	20	6	3	7	4	8	5	8	10
C75.35			1	5	1							
C75.36				1	1			2				
C75.37											1	
C75.38												
C75.39												
C75.40			2		2	3	1	6	3	6	1	6
C75.41												
C75.42	1	1	2		1		1			1	2	3
C75.43	15	8	4	2	2	4	5	1	6		2	5
C75.44	1			1				1				
C75.45	18	18	27	37	27	25	30	28	36	29	43	27
C76												
C76.1												1
C77												
C77.1		1	1		2	1			1	1		1
C77.2											1	
C77.3							1					
C77.4									1			
C78												
C78.1	1								1			
C78.2						3			3			
C79												
C79.1					2							
C79.2												
C79.3									1			
C79.4	2	1			2				3	1	1	2
	344	366	360	401	349	365	450	472	587	612	638	762
	2.21%	2.35%	2.31%	2.58%	2.24%	2.35%	2.89%	3.03%	3.77%	3.93%	4.10%	4.90%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C01												
C01.1											1	0.01%
C01.2											1	0.01%
C01.3											1	0.01%
C02												
C02.1											1	0.01%
C02.2				1							2	0.01%
C02.3		1						1			7	0.04%
C03												
C03.1	4	3	7	1	3	2	4		2	1	86	0.55%
C03.2			1								1	0.01%
C03.3											4	0.03%
C03.4							1				2	0.01%
C03.5								1			1	0.01%
C03.6			1					1			4	0.03%
C03.7											1	0.01%
C03.8			1								4	0.03%
C03.9											1	0.01%
C03.10					1			1	3		5	0.03%
C03.11			3	5	2	1		1			17	0.11%
C03.12											3	0.02%
C03.13	5		1		3	1		1	3	1	55	0.35%
C04												
C04.1	1		1	2	1	1			1		27	0.17%
C04.2											2	0.01%
C04.3			1								1	0.01%
C04.4											0	0.00%
C04.5											1	0.01%
C04.6							1				1	0.01%
C04.7											2	0.01%
C04.8					1		1				5	0.03%
C05												
C05.1											1	0.01%
C05.2						1					1	0.01%
C05.3					1						1	0.01%
C05.4								1			1	0.01%
C06												
C06.1	2	2		1	1		1	2			25	0.16%
C06.2	1										1	0.01%
C06.3											1	0.01%
C06.4									1		1	0.01%
C06.5				1	1	1					3	0.02%
C06.6			1					1			2	0.01%
C06.7	1		1		1	2					8	0.05%
C07												
C07.1	1					1					17	0.11%
C07.2											1	0.01%
C07.3											1	0.01%
C07.4							1				1	0.01%
C07.5							1				1	0.01%
C07.6							9				9	0.06%
C07.7											1	0.01%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C07.8	1	4		1					1		10	0.06%
C08												
C08.1		1	2	1			1	1			9	0.06%
C08.2											1	0.01%
C08.3		2	2	1	2						12	0.08%
C09												
C09.1								1			1	0.01%
C10												
C10.1	2		1	1	2	1	2	1	3		66	0.42%
C10.2									1		3	0.02%
C10.3											4	0.03%
C10.4					1						3	0.02%
C10.5											1	0.01%
C10.6	1				1		3				6	0.04%
C10.7			2	1					1		7	0.04%
C10.8		1									1	0.01%
C10.9								1			1	0.01%
C10.10	1	1				1					3	0.02%
C10.11				1							1	0.01%
C10.12				1			1				8	0.05%
C10.13											1	0.01%
C10.14	1	1	3	3	4	3	3	3	5		45	0.29%
C11												
C11.1											1	0.01%
C11.2											1	0.01%
C11.3	2			1							3	0.02%
C12												
C12.1	106	101	114	111	98	122	83	99	53		1064	6.84%
C12.2	1		6	8		9	3	2	1		39	0.25%
C12.3					1				1		2	0.01%
C12.4											0	0.00%
C12.5											0	0.00%
C12.6	11	13	6								57	0.37%
C12.7			6	5	4	5	5	6	6		37	0.24%
C12.8											0	0.00%
C12.9											0	0.00%
C12.10											0	0.00%
C12.11											1	0.01%
C12.12											0	0.00%
C12.13											0	0.00%
C12.14											0	0.00%
C12.15								1			1	0.01%
C12.16	31	75	96	54	61	56	44	48	20		615	3.95%
C12.17			6	8	18	14	13	12	2		84	0.54%
C12.18											1	0.01%
C12.19											6	0.04%
C12.20	372	351	78						1		1374	8.83%
C12.21		1	170	293	286	304	306	349	245		1969	12.65%
C12.22	1										5	0.03%
C12.23	1										1	0.01%
C12.24	1		1								46	0.30%
C12.25											3	0.02%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C13												
C13.1				1							4	0.03%
C14												
C14.1							1				1	0.01%
C15												
C15.1								4			4	0.03%
C15.2									1		1	0.01%
C15.3									1		1	0.01%
C16												
C16.1	4	5	5	1		2					69	0.44%
C16.2					1						1	0.01%
C16.3											1	0.01%
C16.4											1	0.01%
C16.5									1		5	0.03%
C16.6	1										1	0.01%
C16.7											1	0.01%
C16.8	1										8	0.05%
C16.9											0	0.00%
C16.10											1	0.01%
C16.11								2			2	0.01%
C16.12				1							1	0.01%
C16.13									1		4	0.03%
C16.14											1	0.01%
C16.15		1		1				1	1		10	0.06%
C17												
C17.1	1	1	7	5	2	4	2	2	2		52	0.33%
C17.2											2	0.01%
C17.3								1			2	0.01%
C17.4									1		2	0.01%
C17.5			1								2	0.01%
C17.6			1	2		1	3		2		9	0.06%
C17.7						3		2	1		6	0.04%
C17.8		1			1						2	0.01%
C17.9	2		1	4	2	1	3	2	1		27	0.17%
C18												
C18.1											1	0.01%
C19												
C19.1	26	31	30	26	29	37	30	32	19	2	496	3.19%
C19.2	1	3		2	4	1	2	1	1		19	0.12%
C19.3	2										4	0.03%
C19.4	1	1									4	0.03%
C19.5											1	0.01%
C19.6		2					1				9	0.06%
C19.7							1				4	0.03%
C19.8							2	5	7		14	0.09%
C19.9			2	1		3	3				32	0.21%
C19.10											3	0.02%
C19.11	1										1	0.01%
C19.12				1							3	0.02%
C19.13	3	1	3	5	4	3	3	5	1		58	0.37%
C19.14		1						1			2	0.01%
C19.15											2	0.01%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C19.16	1						1				2	0.01%
C19.17											1	0.01%
C19.18	1										3	0.02%
C19.19		1	1	3	1			1	1		15	0.10%
C19.20		2	3	2	5	1	5	6	1	3	38	0.24%
C19.21						1					1	0.01%
C19.22									1		1	0.01%
C19.23											5	0.03%
C19.24	5		3								19	0.12%
C19.25											4	0.03%
C19.26			1								3	0.02%
C19.27				6	8	13	24	22	38	2	113	0.73%
C19.28	4	2	3	3	3	8	4	9	5	1	75	0.48%
C19.29	1										1	0.01%
C19.30	4	3	5	3	1	1		1			38	0.24%
C19.31		1	1	2	4	2	1	3	1		33	0.21%
C19.32											2	0.01%
C19.33	36	25	50	59	31	28	22	30	28		639	4.11%
C20												
C20.1									1		1	0.01%
C20.2	1	1				1					6	0.04%
C21												
C21.1		1	1								14	0.09%
C21.2											1	0.01%
C21.3											1	0.01%
C21.4											2	0.01%
C21.5	1			9		1	1				16	0.10%
C22												
C22.1	3	4	2	7	2	4	4	3	1		115	0.74%
C22.2											3	0.02%
C22.3											1	0.01%
C22.4											1	0.01%
C22.5			1								2	0.01%
C22.6											3	0.02%
C22.7	1										1	0.01%
C22.8									1		1	0.01%
C22.9	1	1	1								8	0.05%
C22.10				1							1	0.01%
C22.11						1		1			4	0.03%
C22.12											1	0.01%
C22.13					1	1	1	1	1		5	0.03%
C22.14		2			1			6			10	0.06%
C22.15	1	1					2				4	0.03%
C22.16		1									7	0.04%
C22.17	6	1	1			2	5	2	2		56	0.36%
C23												
C23.1						5	6	4	7		22	0.14%
C23.2									1		1	0.01%
C23.3					1				1		4	0.03%
C23.4							3				3	0.02%
C23.5						1					1	0.01%
C23.6						4	16	15	10		45	0.29%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C23.7					1				2		3	0.02%
C23.8								1			1	0.01%
C23.9									1		1	0.01%
C23.10						2	6	2	8		18	0.12%
C24												
C24.1												0.00%
C24.2	3			4	3	1					30	0.19%
C24.3			1								1	0.01%
C24.4					1						2	0.01%
C24.5	1	2			1						4	0.03%
C24.6												0.00%
C24.7											1	0.01%
C24.8	5	1		5	2	1					21	0.13%
C25												
C25.1	2	4	2	5	2	3					204	1.31%
C25.2				1							2	0.01%
C25.3											2	0.01%
C25.4											2	0.01%
C25.5											5	0.03%
C25.6	2	1		3	2						51	0.33%
C25.7											1	0.01%
C25.8											1	0.01%
C25.9											1	0.01%
C25.10											2	0.01%
C25.11	1	4			3						20	0.13%
C25.12											1	0.01%
C25.13	1	2	1	5	1	1					19	0.12%
C25.14	4	8	1								23	0.15%
C25.15											1	0.01%
C25.16			2	4	13	5					24	0.15%
C25.17	2	1	2	1							22	0.14%
C25.18				1							1	0.01%
C25.19											2	0.01%
C25.20	5	2	1		1						33	0.21%
C25.21	4	2	6	3	5	6					106	0.68%
C26												
C26.1											1	0.01%
C27												
C27.1							1	1			2	0.01%
C27.2							1	4	1		6	0.04%
C27.3		1				1					2	0.01%
C27.4								1			1	0.01%
C28												
C28.1											1	0.01%
C29												
C29.1											1	0.01%
C29.2											1	0.01%
C29.3						3					3	0.02%
C30												
C30.1	4		2		1	1		1	2		19	0.12%
C30.2	1	1	1			1					12	0.08%
C30.3											1	0.01%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C30.4											1	0.01%
C30.5											1	0.01%
C30.6											1	0.01%
C30.7							1				1	0.01%
C30.8	1										3	0.02%
C30.9						1					1	0.01%
C30.10											2	0.01%
C30.11		1									1	0.01%
C30.12											1	0.01%
C30.13					1						9	0.06%
C31												
C31.1		1			1			1	1		13	0.08%
C31.2											1	0.01%
C31.3								1			1	0.01%
C31.4											2	0.01%
C31.5	2		3	5	7	7	5	6	10		90	0.58%
C31.6					1						1	0.01%
C31.7											1	0.01%
C31.8											2	0.01%
C31.9			1								1	0.01%
C31.10		1			1				1		3	0.02%
C31.11											1	0.01%
C31.12				1	1				1		8	0.05%
C31.13		2	1	3	4	2	2	3			36	0.23%
C32												
C32.1											4	0.03%
C33												
C33.1	1	1	1		1	1	1	1			7	0.04%
C33.2									4		4	0.03%
C33.3								1	2		3	0.02%
C33.4					1						1	0.01%
C33.5					1				8		10	0.06%
C34												
C34.1			1		1						4	0.03%
C34.2											1	0.01%
C34.3									1		5	0.03%
C35												
C35.1	6		2	2	1	1	4				174	1.12%
C35.2											1	0.01%
C35.3											3	0.02%
C35.4											3	0.02%
C35.5	1	1	1								4	0.03%
C35.6											1	0.01%
C35.7											3	0.02%
C35.8	1		1								2	0.01%
C35.8	1	1									3	0.02%
C35.9				3							3	0.02%
C35.10								1			3	0.02%
C35.11											1	0.01%
C35.12	1	1									4	0.03%
C35.13			2		1						21	0.13%
C36												

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C36.1												0.00%
C36.2			1								1	0.01%
C36.3		1									3	0.02%
C37												
C37.1	9	6	8	2	7	6	5	2	2		144	0.93%
C37.2											3	0.02%
C37.3											6	0.04%
C37.4							1				1	0.01%
C37.5											35	0.22%
C37.6	8	6	5	5		4		3	3		80	0.51%
C37.7						1					1	0.01%
C37.8											1	0.01%
C37.9	1	1									4	0.03%
C37.10	27	25	9								153	0.98%
C37.12											1	0.01%
C37.13			1								1	0.01%
C37.14			25	42	62	40	46	54	42	1	312	2.01%
C37.15						1	1		1		3	0.02%
C37.16								1			1	0.01%
C37.17				1	1	2		2			9	0.06%
C37.18	6	14	6	3	6	2	2	3			148	0.95%
C37.19		1		3	1	1	2		1		25	0.16%
C38												
C38.1											1	0.01%
C38.2							1		2		3	0.02%
C38.3	1	2									5	0.03%
C38.4											1	0.01%
C38.5	1							2			13	0.08%
C39												
C39.1			1								4	0.03%
C39.2						1					2	0.01%
C40												
C40.1											1	0.01%
C40.2											9	0.06%
C40.3											1	0.01%
C40.4					1						1	0.01%
C41												
C41.1							1				1	0.01%
C42												
C42.1											5	0.03%
C42.2											0	0.00%
C42.3											1	0.01%
C42.4											2	0.01%
C42.5								1			1	0.01%
C42.6			1		1	1					10	0.06%
C43												
C43.1				1							1	0.01%
C43.2		1									3	0.02%
C43.3								1			1	0.01%
C43.4						2	1		1		6	0.04%
C43.5											2	0.01%
C43.6			1		2		2		2		15	0.10%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C44												
C44.1	7	6	5	6	2	7	11	6	2		126	0.81%
C44.2			1			1					3	0.02%
C44.3								1	1		2	0.01%
C44.4				1							5	0.03%
C44.5				2	1	1	1	1			12	0.08%
C44.6											1	0.01%
C44.7											1	0.01%
C44.8											2	0.01%
C44.9	1		2	2	3	1					9	0.06%
C44.10							1				1	0.01%
C44.11	1	2									5	0.03%
C44.12			2	8	7	9	5	12	6		49	0.31%
C44.13				2							2	0.01%
C44.14					2		2				6	0.04%
C44.15											2	0.01%
C44.16								1			3	0.02%
C44.17					2	1			2		9	0.06%
C44.18	5	2	7	7	5	19	8	3	8		141	0.91%
C45												
C45.1	7	2	3	2		1			1		42	0.27%
C45.2											1	0.01%
C45.3											1	0.01%
C45.4											2	0.01%
C45.5								1			1	0.01%
C45.6											1	0.01%
C45.7								1			1	0.01%
C45.8											1	0.01%
C45.9						1					1	0.01%
C45.10											1	0.01%
C45.11											1	0.01%
C45.12	3	4	1		1	1			1	1	19	0.12%
C46												
C46.1							1	3			4	0.03%
C46.2												0.00%
C46.3											5	0.03%
C46.4					1	1		1			8	0.05%
C47												
C47.1						1					1	0.01%
C48												
C48.1	2	1				4	3	2	3		39	0.25%
C48.2											1	0.01%
C48.3				1							1	0.01%
C48.4							1				1	0.01%
C48.5									1		1	0.01%
C48.6			1								2	0.01%
C48.7		1	1		2		1			1	11	0.07%
C49												
C49.1									1		2	0.01%
C49.2	1										2	0.01%
C49.3											0	0.00%
C49.4								1			1	0.01%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C49.5											1	0.01%
C49.6												0.00%
C49.7	1										1	0.01%
C49.8											1	0.01%
C49.9				1			1				5	0.03%
C50												
C50.1				1							1	0.01%
C50.2											1	0.01%
C51												
C51.1	3	1				1					13	0.08%
C52												
C52.1											1	0.01%
C52.2											1	0.01%
C53												
C53.1			1								1	0.01%
C53.2											1	0.01%
C53.3											1	0.01%
C53.4	1	1									3	0.02%
C54												
C54.1			2		2	1		1	1		43	0.28%
C54.2		1									1	0.01%
C54.3											1	0.01%
C54.4											1	0.01%
C54.5											2	0.01%
C54.6											1	0.01%
C54.7	1		1	3							13	0.08%
C54.8											2	0.01%
C54.9											1	0.01%
C54.10		1	4	3	1						17	0.11%
C55												
C55.1											1	0.01%
C55.2												0.00%
C55.3											1	0.01%
C55.4											1	0.01%
C56												
C56.1											1	0.01%
C57												
C57.1	2	1	3	8	1						36	0.23%
C57.2	1	1									2	0.01%
C57.3					1						1	0.01%
C57.4			1				1				3	0.02%
C57.5					1						1	0.01%
C57.6											2	0.01%
C57.7			1	4	3	1					11	0.07%
C58												
C58.1							1	15	9		25	0.16%
C58.2								1			1	0.01%
C58.3								1			1	0.01%
C59												
C59.1	1					1		1	1		5	0.03%
C59.2									1		1	0.01%
C59.3								1			2	0.01%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C59.4			1								1	0.01%
C59.5					1			3			4	0.03%
C59.6			1					2			3	0.02%
C59.7											1	0.01%
C59.8	1				1						3	0.02%
C60												
C60.1											1	0.01%
C60.2											1	0.01%
C60.3	1		1		1						22	0.14%
C61												
C61.1			1								2	0.01%
C61.2	1								1		2	0.01%
C61.3					1						1	0.01%
C61.4											3	0.02%
C61.5						1					8	0.05%
C62												
C62.1				1		1	2		2		15	0.10%
C62.2											2	0.01%
C62.3								1	3		4	0.03%
C62.4		1									4	0.03%
C62.5						1					2	0.01%
C62.6			1								1	0.01%
C62.7			1	1	1			1			4	0.03%
C62.8								1			2	0.01%
C62.9	2	5	2	3	5	2	4		3		73	0.47%
C63												
C63.1	3	1	2	1			1	2	1		15	0.10%
C63.2	1										6	0.04%
C63.3	1										1	0.01%
C63.4											0	0.00%
C63.5					1						1	0.01%
C63.6								1	1		2	0.01%
C63.7							1				4	0.03%
C63.8			1		1						8	0.05%
C64												
C64.1											3	0.02%
C64.2							1				1	0.01%
C64.3											4	0.03%
C64.4	1										3	0.02%
C65												
C65.1	1	3	3	2	1	2	3	6	5		58	0.37%
C65.2		1									1	0.01%
C65.3											1	0.01%
C65.4											1	0.01%
C65.5											1	0.01%
C65.6					1						2	0.01%
C65.7			1								1	0.01%
C65.8					1				1		2	0.01%
C65.9	2					1		2			8	0.05%
C65.10					1						1	0.01%
C65.11											1	0.01%
C65.12	1								2		4	0.03%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C65.13	2	1	4	1	3		1	2	1		32	0.21%
C66												
C66.1	2	5	3	2	2	3	1	3	5		57	0.37%
C66.2							1	1	2		7	0.04%
C66.3											2	0.01%
C66.4											1	0.01%
C66.5				1							4	0.03%
C66.6							4		2		6	0.04%
C66.7							1				1	0.01%
C66.8	2	1	1								8	0.05%
C66.9											1	0.01%
C66.10											2	0.01%
C66.11											1	0.01%
C66.12											1	0.01%
C66.13	2	6	4		2	6	2	3	1		40	0.26%
C66.14							1				1	0.01%
C66.15											1	0.01%
C66.16					1		1				3	0.02%
C66.17											1	0.01%
C66.18											1	0.01%
C66.19			2		1	1	1		2		9	0.06%
C66.20				1							1	0.01%
C66.21											1	0.01%
C66.22											1	0.01%
C66.23	1	5	1								13	0.08%
C66.24											1	0.01%
C66.25	1		3	4	4	7	10	6	5		40	0.26%
C66.26					1	2					3	0.02%
C66.27							1				1	0.01%
C66.28	6	3	6	4	6	6	6	2	1		81	0.52%
C66.29	1		3		1	1					13	0.08%
C66.30	1	2	1	3	2	1	1				20	0.13%
C66.31											1	0.01%
C66.32	7	24	10	16	22	13	36	22	14	1	246	1.58%
C67												
C67.1											1	0.01%
C68												
C68.1				3		2	1	1			15	0.10%
C68.2				1							1	0.01%
C68.3	2								2		5	0.03%
C68.4											10	0.06%
C68.5											1	0.01%
C68.6	1	2	3	4	1	2	1	3			17	0.11%
C68.7							1				1	0.01%
C69												
C69.1											1	0.01%
C69.2			1								1	0.01%
C69.3								1			1	0.01%
C69.4						1					1	0.01%
C69.5	1						1				4	0.03%
C69.6							1	1			4	0.03%
C70												

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C70.1	2						1				19	0.12%
C70.2	1										1	0.01%
C71												
C71.1											1	0.01%
C71.2											2	0.01%
C72												
C72.1				1			1				2	0.01%
C72.2	1				3	2	3				10	0.06%
C72.3	1										1	0.01%
C72.4											4	0.03%
C73												
C73.1	53	46	56	62	71	49	54	3			748	4.81%
C73.2			1	1	2						4	0.03%
C73.3											1	0.01%
C73.4											1	0.01%
C73.5	5	7	2	1		2	3				64	0.41%
C73.6				1							2	0.01%
C73.7								1			2	0.01%
C73.8			1								1	0.01%
C73.9						1	3				4	0.03%
C73.10						1					6	0.04%
C73.11	4		4	6	2	6	7				59	0.38%
C74												
C74.1								4			4	0.03%
C74.2								1			1	0.01%
C74.3								1			1	0.01%
C74.4									1		1	0.01%
C75												
C75.1	31	32	22	29	34	14	35	53	35	1	1000	6.43%
C75.2								1			2	0.01%
C75.3	2	1		2	1		1	9			29	0.19%
C75.4											0	0.00%
C75.5											0	0.00%
C75.6								1			3	0.02%
C75.7		3	2								22	0.14%
C75.8				1	1						2	0.01%
C75.9	1								1		3	0.02%
C75.10					1						1	0.01%
C75.11											2	0.01%
C75.12		1									49	0.31%
C75.14											1	0.01%
C75.15											3	0.02%
C75.16							1	5	3		9	0.06%
C75.17									1		1	0.01%
C75.18	2	2	5	2	1	2	1	9			68	0.44%
C75.19		1									2	0.01%
C75.20											1	0.01%
C75.21											1	0.01%
C75.22											1	0.01%
C75.23				1							1	0.01%
C75.24	2	1	1	2	2	4	7	10	4		64	0.41%
C75.25	1										3	0.02%

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	
C75.26						1	1	1			3	0.02%
C75.27											3	0.02%
C75.28											2	0.01%
C75.29	6	8	14	15	15	5	7	9	11		143	0.92%
C75.30				1					1		2	0.01%
C75.31			1								1	0.01%
C75.32		1	1								4	0.03%
C75.33											5	0.03%
C75.34	4	12	3								97	0.62%
C75.35											7	0.04%
C75.36						1					5	0.03%
C75.37			14	16	31	44	36	58	45	1	246	1.58%
C75.38				2							2	0.01%
C75.39							1				1	0.01%
C75.40	2	5	4	17	3	4	7	6	10	1	90	0.58%
C75.41				1	1						2	0.01%
C75.42		2	3	1				3	2		25	0.16%
C75.43	3		5	3	1	2		3	5		101	0.65%
C75.44											6	0.04%
C75.45	34	29	39	28	36	28	38	39	38	1	724	4.65%
C76												
C76.1					2						4	0.03%
C77												
C77.1	1	1				1					11	0.07%
C77.2											1	0.01%
C77.3											1	0.01%
C77.4											1	0.01%
C78												
C78.1											3	0.02%
C78.2											6	0.04%
C79												
C79.1					1			1			4	0.03%
C79.2							2	2	1		5	0.03%
C79.3											1	0.01%
C79.4	1						1				24	0.15%
	996	981	995	1043	1038	1024	1043	1126	836	18	15561	100.00%
	6.40%	6.30%	6.39%	6.70%	6.67%	6.58%	6.70%	7.24%	5.37%	0.12%	100.00%	

SECTION VIII: CONTENT ANALYSIS STUDY

Content Analysis of Sample Articles:

Indicators of a Paradigm Shift

According to Laudan, et al. (1986), rarely have historians and/or sociologists of science broken down the claims made by theorists, formulated them "as precisely as possible", and tested them individually for the most part because the aim of most historical research is the construction of an "*analytic narrative* of social and cultural history, not theory of science" (p. 159). The same is true of most bibliometric analysis. An attempt will be made in this study to address each of the claims listed; however, only a limited attempt will be made to identify a global theory of medicine. It is assumed that there are guiding assumptions about what is the dominant view or paradigm that states that modern medicine is the only valid and acceptable form of medicine and that all other forms, i.e. alternative medicine which includes non-Western medicine, are invalid and not worth studying.

Other points made by Laudan, et al. that are applicable to a study of scientific communication are that claims about scientific revolutions or paradigm change should be based on either extensive manuscript materials such as diaries and private correspondence between scientists working on developing critical theories, or on extensive public pronouncements that are documented as a matter of published record. This study will examine indexed literature as a tool to uncovering such pronouncements. Laudan, et al. also warn that there should be enough scientists in the sample and that the historical period should be long enough to take into account the time it takes for science to react to both anomalies and shift in research interest. The sample size of this study is comprehensive in that all authors whose articles are

indexed under the topics classified as non-Western medicine will be included and the time period selected begins at the beginning of the availability of online searching and ends with the present.

Method

Content analysis of sample articles extracted from a sample frame identified from analysis of the patterns of growth in the literature is used here to support the claims that a scientific paradigm change within medicine is in progress. Keywords and phrases expressing debate and change are identified along with passages specifically addressing the issue of paradigm change itself. Additional coding of text is used to reveal use of combined traditional and Western medicine to test theoretical assumptions surrounding the issue of rival sets of viewpoints and techniques.

A sample of 107 articles was extracted from a print out of all the references that met the following criteria:

1) MESH = Philosophy; Philosophy, Medical; Model, Theoretical; Model, Biological; Model, Medical; Model, Neurological

2) Reference appeared in a refereed medical society journal and the title and/or abstract of the reference contained a question mark or words and phrases such as "enigma", "interaction", "medical system", "determinants" or "East Meets West".

Each article was photocopied and then read in its entirety. In addition, print-outs of all the abstracts were read and marked but not enough information was contained in the abstracts to justify entering them into a full-text analysis program. Highly modified Standard Generalized Markup Language tags (SGML) were added to passages containing keywords and phrases coded according to constructs extracted from the theoretical assumptions and the hypotheses. Passages indicating findings

such as "not significant" were also coded to be summarized in a future report.

Specific words (e.g. hoax, humbug, allegedly, supposedly, reckless, irresponsible, biased, etc.), clauses, sentences and paragraphs appearing in the texts were highlighted using colored markers and then keyed into Table 15 (presented at the end of this chapter). Lengthy passages describing the history of acupuncture or Chinese Traditional Medicine or long descriptions of health care in Middle Eastern, African, Latin American, or Asian/Pacific communities were simply coded as descriptive-background-explanatory material and the references in which they appear are given without transcribing the passages themselves. Keywords (KW) and coding are marked for each passage.

Findings

H 1: "The coexistence of rival sets of guiding assumptions in a science is the rule rather than the exception. Debate about rival sets of assumptions does not alternate with periods of universal assent to one set, but occurs constantly" (Laudan, et al. 1986, p. 155).

Sentiments that fall into the category of those expressing that there is a debate going on are explicitly stated in examples in Table 15 (ex. 22,24,80,99) and in Table 16 in examples where the keyword "debate" or "controversy" is actually used. Although the word "debate" is not used in most of the articles, most do contain passages discussing the pros and cons surrounding the topics discussed and as such can be coded on the macro level as debates.

There is additional supporting evidence that a debate is underway in the published interview and media reports. Raymond Dussault writes in the November 1, 1993 issue of *The Business Journal, Serving Greater Sacramento* in questioning

whether alternative medicine works or not, that "The debate rages on, but the Eisenberg study leaves no doubt that this question has little effect on many customers". In a *Washington Post* article on November 19, 1993, Margaret Mason adds that Janet Smith, founder of the 25-organization, nonprofit National Wellness Coalition, demanded that the Clintons reframe the "Great Health-Care Debate" by noting that

> Fifty percent of all deaths and up to 90 percent of all illness in our society are considered preventable . . . the product of our lifestyle, including stress, environment, diet, physical activity and our overall system of values.
>
> Yet we currently spend less than 5 percent of our national health-care resources on prevention. Meanwhile, the national dialogue on health-care reform has focused mainly on assuring Americans that insurance will be available to produce financial security once they become ill, rather than on how health-care reform can improve our health.

Fran O'Connel in *Best's Review - Property-Casualty Insurance Edition*, on September 1, 1994 writes that there are "three fundamental realities of many alternative practices that continue to stir emotional debate among mainstream health care professionals" - 1) "many providers operate outside the jurisdiction of supervisory bodies charged with overseeing the quality of professional services"; 2) "Few protocols exist to monitor these practices"; and 3) "few scientific studies have successfully linked specific treatments with measurable results"; each point made using language that almost matches that used by Laudan et al. and Kuhn in their philosophical discussions of scientific paradigm change.

H 2: "A later set of guiding assumptions seldom accommodates all the explanatory successes of its predecessors. There are losses as well as gains in the replacement process" (ibid., p. 155).

It is too early to test H2 because no new paradigm has yet to emerge. The biomedical

model is crumbling, on the other hand, no one has suggested replacing it, only integrating components of other models into it. It is a logical claim and will probably be confirmed in the future once someone has explained from a theoretical point of view how biomedicine has been proven to be successful in many instances without having a theoretical foundation.

H 3: Statements expressing dissatisfaction with conventional medicine made within abstracts of and the articles themselves will begin to appear as the number of articles on non-Western medicine escalates.

Statements expressing dissatisfaction with conventional medicine that actually use words connoting "dissatisfaction" do appear in the literature. Other statements such as Bourne's (Table 15, ex. 24) who uses the word "disenchantment" are interpreted here as expressing the same sentiment.), Gideon (1977 - Table 15 ex.) who concludes that physicians seek alternative therapy for "seemingly hopeless patients unresponsive to conventional therapy" uses words that can be also interpreted as falling under the category of dissatisfaction in the sense that all known treatments failed and thus, the physician and the patient were dissatisfied with the results and turned to alternative treatments out of desperation. Specific examples (Table 15, ex. 15,25,51,58,67,69,91,95) are found throughout the timeline in articles from all nine subject areas. Similarly some authors remark on the failure of biomedicine as seen in (Table 15 ex. 2,15,23,24,28,43,44,46,49,55,74,82,97,99,102). For example, Pfifferling (1975 - Table 15 ex. 28) writes that "So much data that is relevant to the understanding of the illness is lost by basing our search for causation on retrospective data collection" (p. 656). Although not explicitly stated, Pfifferling seems to be criticizing at least one aspect of biomedicine and thus, for the purpose of this study,

criticism conveys dissatisfaction to some degree. Even Kroger (Table 15, ex. 15), whose words will be used latter, notes that the popularity of alternative medicine is a direct result of "Many physicians" "being bombarded with calls from frantic people looking for a "miracle cure" (p. 193). "Modern" medicine cannot treat many conditions, and physicians faced with angry, desperate patients are forced to confront the limitations of the biomedical paradigm.

H 4: "Whether a shift in guiding assumptions is both unreasoned and externally caused - perhaps the result of propaganda or a gestalt switch - or whether scientists are guided entirely by scientifically relevant reasons when they change allegiance" (ibid., p. 157).

H 5: Specific external factors occur a few months before changes in research direction and publication output on the issues raised surrounding the external event or events.

From the graphs of the growth of the literature on acupuncture it can clearly be seen that Nixon's visit to China and Reston's widely publicized operation triggered a surge in research output. Examples from 1971 use such phrases as "growing interest" or "increasing use of" and "widely publicized". There is no doubt that the events surrounding Nixon's trip to China and the opening of relations served as the catalyst for international exchange. A similar event is found in the literature on Ayurveda surrounding the missionary zeal and widespread popularity of Deepak Chopra in some part due to the controversy over his ethics. As far as the public is concerned, Chopra has "opened the door" to Ayurveda in the same way Nixon opened the door to China. More than enough evidence exists to support both H4 and H5.

H 6: Traveler's accounts, foreign exchange or any form of exchange where personnel

travel to other locales are catalysts for change in that eye witness accounts of different methods, techniques, tools, and/or approaches to solving problems will be used to question how such problems are solved within the current prevailing paradigm.

Keeping in mind that the articles in this sample were selected based on criteria extracted from MEDLINE's coding, it is clear that the articles that appeared shortly after Nixon's trip to China are filled with traveler's accounts documenting the authors' first-hand encounters with acupuncture, and the Chinese medical system. The kinds of statements and passages found in examples Table 15 (2,4,5,7,11,13,15,17-19,24,27,39,48,60,65,67) disappear in this highly selective sample by 1984. One exception may found in Foster (1989- Table 15, ex. 91) who, in his Presidential address to the New England Surgical Society, opens by commenting that "I have no valid credentials for talking about Eastern values. I have spent a total of slightly less than 4 months on four different trips to the Orient, and much of that time was in the countryside" (p. 702). Foster then remarks latter on that

> The travelling Westerner (and that includes most Japanese) sees the world through the aperture of his camera, fixing and measuring it for the permanent record so that he and his wife can argue over whether that building was the Temple of Heavenly Bliss or the Palace of Eternal Enchantment the next time they show their slides (p. 704).

Apparently by the time Foster made these remarks, the novelty of making the point that one had visited China or Tibet or India was seen by some as nothing more than ego speaking. It can only be presumed that if all the articles from this time period could be retrieved that a similar result would be obtained.

H 7: Proponents of one set of guiding assumptions cannot communicate fully with adherents to an opposing set of guiding assumptions.

Hypothesis 7 is supported to some degree by an example (Man, Chen, & Calvin

1972 - Table 15, ex. 10) that states that the authors relied on the Man's personal training and experience in order to gain access to materials and to communicate with practitioners and researchers from the target community of researchers. However, the broader issues is not just language and culture but whether or not researchers can communicate to one another working from diametrically opposed belief systems. Early works contain passages where the authors simply dismiss any "notion" that the meridian system in acupuncture may have a basis in fact (Note the context of passages in Table 15 marked <MERIDIAN SYSTEM>). These authors did not even entertain the idea that the meridian system, the yin-yang system nor the five element system had any scientific validity. Cai (1987; Table 15, ex. 78) writes

> Health care administrators in almost all states in the world are trained in the western style and, as a rule, tend to view TM as backward and non-scientific, a notion which has a profound and extensive influence. . . . Some authors, when writing about the experience gained by traditional physicians apply such terms as `allegedly', `is said', showing a remarkable antipathy against TM . . . . Verification of the therapeutic effect of TM is an essential problem in its evaluation . . . . Since the theories of AM <=alternative medicine> are based principally on ancient philosophy, it is not realistic to assess and investigate by disregarding them. . . . We have encountered some opponents who have attacked TM as being non-scientific, claiming the Yin-yang principles and five elements, organography and channel as neither perceptible nor tangible (pp.661, 665).

The early studies, as well as those of Cai's opponents, are thus designed using a highly reductionistic approach to study phenomena isolated from one another with no attempt at proposing alternative theories. In fact much of the literature lacks the kinds of hypothesis building seen in the hard sciences and social sciences.

H 8: The "acceptability of a set of guiding assumptions is judged largely on the basis of its ability to solve problems outside the domain of its initial success" (ibid., p. 164).

H 10: Competing sets of guiding assumptions "are often used simultaneously in scientific research" (ibid., p. 166).

H 11: New sets of guiding assumptions "are suggested long before a good rationale has been provided for them" (p. 167).

H 13: New sets of guiding assumptions are "suggested but ignored long before the older guiding assumptions are perceived to be in difficulty" (p. 167).

H 14: New sets of guiding assumptions are "developed, accepted and exploited before apparently decisive arguments for them have been advanced" (ibid., p. 167).

Hypotheses 8 and 10 are clearly supported by examples 4 and 10 in Table 15. Dimond comments that Dr. Chou, a Western trained physician, had always thought that acupuncture was a "hoax" until he became convinced of its efficacy after "repeated clinical experiences". Man and Chen (1972; Table 15, ex. 10) note that acupuncture was being used despite the fact that "the theory of Chinglo concerning the connection between various parts of the body cannot be explained entirely by our present knowledge of neuroanatomy and neurophysiology" (p. 731).

It appears that medical scientists accept new guiding assumptions when support for them can be found outside their specialities and possibly outside of medicine itself. Pert, for example, feels that the "solutions" will come from physics. Unschuld (1987; Table 15, ex. 82) point out that the constitutionalists, those physicians in the 19th century who opposed the claims of radical bacteriologists who proposed that disease is caused by germs, bacteria or other such external agents, may now find their arguments strengthened by findings in immunology and psychology that state that "something must be wrong internally before an external agent may cause problems within the organism", a major postulate underlying the theories found in Chinese traditional

medicine and Ayurveda.

Support for all four hypotheses can be found in the fact that all of the authors writing about acupuncture begin their papers by making the statement that they were willing to study acupuncture's effectiveness even though there were no acceptable explanations for how it works. Several conclude that although they could not obtain statistically significant results they still felt that researchers should continue to design studies to test acupuncture's effectiveness and to validate all of the ever increasing numbers of anecdotal accounts reporting how acupuncture helped alleviate pain or illness in specific cases.

Further support for all four hypotheses comes from example 32. Chapman's (1977) writes that:

> Pain is a difficult term to define, and consequently analgesia, the absence of pain, is a problematic concept. . . . The present study has demonstrated that acupunctural analgesia is a phenomenon which can provide a new window on the mystery of the human pain experience. As such it provides a rich source for new, provocative, information about pain. Hopefully, the disenchantment of clinicians with the potentials of acupuncture analgesia for Western anesthesia practice will not dissuade basic scientists from using acupunctural phenomena for fact gathering and hypothesis testing (p. 282).

Although looking at the problem from the opposite perspective, Shiloh (1968) observes that

> . . . this is the essential point, both medical systems attack different aspects of the problem. Whereas Western medicine is very concerned with providing an accurate *diagnosis* of a complex of symptoms derived from the germ theory of disease, Middle Eastern medicine is essentially concerned with ascertaining the *cause* of a complex of symptoms based upon the concepts of the evil eye and the evil spirits. Both cultures consider preventive medicine to the internal body to be important, both are equally concerned with the problem, but each attacks it from a position derived from a different medical system.
> . . . . If, with their [villagers] own eyes, they can see results that they recognize as beneficial to them, then regardless of their understanding of the reason, and notwithstanding local tradition and belief, many persons will add to the old by accepting the new.
> . . . . As one commentator of this study has noted: "The villager is a

> pragmatist, not caring who is right but ready to use the method which seems to him to work, or to try both". The Middle East system of medicine has pragmatically examined, rejected, or accepted an integrated series of Western medical practices without necessarily understanding or accepting their rationale.

These words used to describe the villager's willingness to adopt aspects of a new paradigm even though they may not understand it is exactly what Kuhn and others meant when they described scientists during a paradigm shift. How ironic that the patronizing tone of many "observers" of village life can be reflected back on the very scientific community from which the commentators were trained. Other examples supporting H8, H10, H11, H13, and H14 are found in Table 15 (ex. 2,7,10,17,25,36,38,51,56,71,80).

H 9: The number of clinical trials and journal articles about non-Western medicine will increase as evidence of successful treatments increases.

In examining the articles retrieved using the criteria that the article must be coded as a clinical trial in a refereed serial, it was found that MEDLINE's coding is not all that reliable. Several articles reported the findings of clinical trials but were not "clinical trials" themselves and yet they were coded simply as "Clinical Trial. Journal Article". Many of the journal articles were nothing more than discussions about acupuncture, for example, that merely provided background information on the history or techniques. Most were simple literature reviews summarizing findings from previously published reports. However, these were not always coded as "reviews".

The *Guide to Medical Subject Headings - Tree Structures* for 1994 that accompanies *Index Medicus* and MEDLINE contains definitions of each of the publication types used by the indexers. The definition for "Clinical Trial" reads as follows:

> Pre-planned, usually controlled, clinical study of the safety, or optimum dosage schedule of one or more diagnostic, therapeutic, or prophylactic drugs, devices, or techniques in humans selected according to predetermined criteria of eligibility and observed for predefined evidence of favorable or unfavorable effects. While most clinical trials concern humans, this publication type may be used for clinical veterinary articles meeting the requisites for humans. Specific headings for specific phases of clinical trials are also available.

Such additional categories are then defined for Phases I, II, III, and IV. No where in this definition does one find wording to lead the searcher to believe that the reference would be anything less than a report. Nonetheless, this appears to be the case.

References coded as "Journal Articles" are supposed to represent the "predominant publication type for articles and other items indexed for NLM databases" unless otherwise stated, i.e. the article is coded as an "Interview". Noting that all of the "Clinical Trials" in this data set are either "Clinical Trial. Journal Article." or "Clinical Trial. Letter." or one of the other combinations, it might be that these references are not simple "Clinical Trials" as one would usually find in searching the databases.

The best estimation that can be made is that there is support for H9 in the fact that the early examples retrieved for content analysis are descriptive regardless of how they are coded by MEDLINE and the latter studies appear to be strict clinical trials with little or no descriptive summations, definitions of techniques or lengthy translations of foreign words. Some do not even define the points, used assuming that the reader knows exactly where a particular point is located and the significance of its effect along its associated meridian. This last point is probably the most exciting for it can be inferred that by the 1990s researchers in acupuncture, at least, feel that there is a sufficiently large enough and sophisticated enough readership that they can omit the kinds of background information found in the earlier writings. Thus, Merton's

process of obliteration can be seen in progress within the field of acupuncture research.

Two examples from traditional medicine from the *Journal of Ethnopharmacology* (1987) and (1991) both use the names of plants and/or the names of screening tests without defining them for the general reader. In the article on drug screening one finds that throughout the authors have assumed that their audience is familiar with all the technical terms used. For instance, "Cyclic nucleotides play key roles in physiological regulation . . . " appears under a heading that reads "Human platelet adenyl cyclase and phosphodiesterase assays". At no point do the authors define any of these terms which are clearly terms one only uses in chemistry and biology. Latin names of plants are used in the 1991 example in a similar style. "*Radix Aconiti* is looked upon by occidental medicine as a toxic plant . . . " does not include a common name for *Radix Aconiti* nor does it have an embedded clause providing a description of the plant's family. That is to say, the passage from which this example has been extracted does not have the usual "*Radix Aconiti*, an alternative form of the herb, *Aconite carmichaeli* Debx, known as *Wu Tou*, and considered more effective in alleviating pain" that one finds in texts for the general reader of Chinese materia medica.

H 12: A series of journal articles discussing the effectiveness and or medicinal properties of specific non-Western treatments appear in Western journals for several years before clinical trials are published.

Again it must be stressed that the articles used for content analysis, although representing all the clinical trials published in peer review journals, not all the journal articles were obtained. Using this sample, nonetheless, it is clear that articles up until

quite recently focused primarily on the discussion of the effectiveness of therapies and medicinal substances. Clinical trials only appear after there is a period in which articles have been published reporting on the issues surrounding new therapies. A larger sample is needed as is a different type of research design. Nevertheless, there is some support for H12. Using the same argument, one finds support for H16.

H 16: Clinical trials appear before journal articles outlining the components of a comprehensive universal medical model encompassing postulates from the biomedical as well as the socio-psycho-cultural-metaphysical components of the various non-Western medical models are published.

This hypothesis is more difficult to verify but there does seem to be pattern in the literature supporting the claim that clinical trials do not contain much theory nor do they contain passages outlining theoretical assumptions. The journal articles that appear after 1988 (85,87,94) are presented by the authors themselves as works intended to be used as philosophical models of underlying mechanisms. Thus, clinical trials appear after the effectiveness of an alternative therapy has been discussed and before a model or paradigm has been developed to explain how the therapy works.

H 15: Journals published in countries outside of Europe and the United States publish articles on non-Western medicine for several years before such articles are published in the West.

Figures 17-24 comparing output from the U.S., England, France, Germany, and the U.S.S.R. to output from China, India and Japan prepared during the preliminary study refute this claim. Upon closer examination, however, ones sees that there were only two articles listed for China prior to 1973. The fact that Chinese publications were not in MEDLINE could be explained two ways: 1) MEDLINE did not index

Chinese journals or 2) Chinese researchers did not publish articles on non-Western medicine. The first explanation is quite plausible, the second seems impossible. Ironically, the latter explanation appears to be the case. Two of the authors (4,12) note that Mao had suspended publication of all medical journals during the Cultural Revolution as a political move to eradicate all incorrect forms of thought from the scientific community. Thus, a politically motivated national agenda impacted on the flow of scientific communication unlike any other event. Even during times of war, there are a few outlets for scientific communication. Nevertheless, Mao managed to open China and promote the benefits of Chinese traditional medicine while at the same time suppressing all publication on the subject.

H 17: New sets of guiding assumptions "are thought worthy of investigation largely because of factors external to science" (ibid., pp. 167-168).

H 18: Content analysis of abstracts and interviews will reveal references to specific external events that motivated researchers to undertake research outside the prevailing paradigm.

Only a handful of abstracts were long enough to do more than state the findings of the study, on the other hand, the articles do reveal answers to why the articles were written and/or why the studies were conducted. Every article following the publicity about Nixon's trip to China specifically states that this one event was the catalyst for change and that the author's own curiosity or visit to China motivated the author to publish his/her observations. The articles on traditional medicine are more eclectic and no one event appears, although several refer to the need to gather information from disappearing shamanistic traditions and information about medicinal substances in threatened rainforests. The most recent example is a news report dated March 12,

1995 in the *Star Ledger* which specifically states that researchers are trying to collect this data but that it is a very expensive and time consuming process.

One of the examples (32) of a 1975 article in a refereed serial (*Pain*) contains a passage that reveals that the reports of the successes of acupuncture anesthesia triggered the process referred to by Kuhn and others of bringing into question a problem that could not be solved within the prevailing paradigm while at the same time presenting itself as an anomaly in and of itself. Chapman (1975) writes "Reports of "acupuncture anesthesia" continue to draw attention in the Western world, even though acupuncture seems destined to have little direct effect on Western anesthetic practice . . . Interest has been maintained, in part, because acupuncture has introduced many new and provocative questions about the nature of the human pain experience and mechanisms generating analgesic states" (p. 266).

H 19: Proponents of different sets of guiding assumptions "think that the books and articles of the rival set are not fit for scientific study" (ibid., p. 169).

H 20: Proponents of different sets of guiding assumptions "view the world through different conceptual spectacles" (ibid., p. 169).

H 21: Few if any book reviews appear in a data set on an area of medicine outside the dominant paradigm.

It is quite obvious from the graphs generated in the preliminary study that there are only a very small number (4 - Historical; 66 - Monograph) of monographs listed in the data set. It should also be stressed that these refer to references to chapters, not individual titles. There were only 6 actual monographs. Thus, H18 is confirmed.

H 22: The number of book review articles indexed will decrease as the number of clinical trials and research articles increase.

As there were 6 monograph titles coded in the data set it is not possible to state definitely whether H22 is supported or not except for the fact that the reviews only appear between 1975 and 1978 and that they appear only two years after clinical trials begin to appear on the timeline and cease as clinical trials increase.

Robert Ader, Ph.D., in his interview with Moyers (1993) provides support for H19 by telling Moyers that

> A few years ago you couldn't find a textbook in immunology that mentioned the brain. Not only was there no chapter on the brain, you couldn't even find `brain' in the index. Recent textbooks are now coming out with statements like `The current data coming from psychoneuroimmunology indicate that, as we have long suspected, the immune system may not be completely autonomous.' Even though it may sound a little begrudging, there is increasing acknowledgement of the role of these other influences on immune system behavior. And that has phenomenal implications for the way the immune system is studied (p. 241).

Similarly, David Felten, M.D., Ph.D., Professor of Neurobiology and Anatomy at the University of Rochester School of Medicine, and Recipient of a MacArthur Foundation Prize Fellowship in 1983 told Moyers that ". . . many immunology textbooks still talk about the immune system as an entirely autonomous, self-regulating system. Similarly, the brain scientists approached the neurosciences without taking immunology into account" (p. 215). Although not specifically referring to non-Western medicine, per se, Ader and Felten do substantiate the point that the mind-body connection was omitted from textbooks until quite recently and the inference can be drawn that at least this step would have to have been taken before the other medical systems could be given serious attention.

What was found were numerous examples of the use of the word "quack" and its derived forms throughout the medical literature and throughout the Dow Jones Dowquest texts and most recently in a posting on the SciFraud listserv on March 10,

1995 by Jim Whitehead, North Dakota,

> Following the arrival of "The Journal of Alternative and Complementary Medicine," onto my desk (courtesy of a colleague who has no idea why he is on the mailing list), has come notice of "The First Annual International Congress on Alternative and Complementary Medicine." The program seems to be organised under different sections. For example, under "Health Systems" Homeopathy, chiropractic, Therapeutic Touch, and Chinese Integrated are listed along with "Allopathic." Under "Healing Traditions" are listed Ayurveda, Acupuncture, Shamanic healing, Curanderismo (??), and Phytomedicine. On the list of workshops are sessions on chelation therapy, light therapy, and somatic systems and reflexology. The keynote speaker is Tom Harkin, and his political friend of NIH OAM fame, Berkley Bedell, is scheduled to talk on "Legislative issues: Access to medical care." Am I the only one sensing that this is a major attempt to bring undeserved respectability to a lot of nonsense--or is this legit? I can't help feeling that this is part of a well orchestrated campaign to force health insurers to reimburse quacks? (permission received to quote via electronic mail correspondence)

Whitehead's question to the members of a listserv specifically chartered to discuss scientific fraud is a perfect example of just how strongly many in the scientific community feel about the way alternative medicine is being promoted by none other than the National Institute of Health of the United States and a powerful Democratic senator.

There are several other such examples in the Dowquest literature (Table 16 ex. 1-28) and from the medical literature (Table 15, ex. 4,15,23,69,84,99) that also support the claim that anything that is not sanctioned under the umbrella of biomedicine is considered to be quackery by virtue of the rule that states if it is not X, it must be Y. Unfortunately, much of non-Western medicine is not delineated from the packaging of the New Age movement's alternative medicine. Whitehead's question marks after "curanderismo" is interesting in that there is a growing movement in communities in and from Latin America in consulting the curandero/a, or "healer" to the extent that several hospitals have had to create programs for their staff to educate them about

their patients' very strong belief in the power of such healers. However, unless one is trained in anthropology or has a particular interest in the field, such terms and traditions are not part of one's vocabulary and would, as a result, seem at first glance like simple witch doctoring. Unfortunately, many examples can be used to support this view considering the fact that many practitioners have set themselves up into a business without having undergone an often times grueling and long apprenticeship.

H 23: Statements about government or social policy actively discouraging non-Western medicine appear throughout the literature on medicine wherever the biomedical model has been made the dominant paradigm.

Several of the historical articles do reveal that government policy in every country mentioned has at one time or another actively tried to discourage or actively tried to encourage the use of traditional medicine. One article not in the MEDLINE data set is on the laws passed and efforts made to "wipe out" the Maori *tohunga* (Voyce 1989). Another, (Zhao [1991], based on a 1983 dissertation the editor states is difficult to obtain both inside and outside of China) gives a thorough account of the implementation of laws that were passed and the excerpts from the various resolutions debated by the different governments of China in the twentieth century. Others (Table 15, ex. 23,58) make reference to licensing practices. Curran (1981; Table 15, ex. 58) gives an account of a court case in Harris County, Texas where the judge ruled that by requiring acupuncturists to be licensed the state was placing a barrier to access between the public and the practitioners. What was unusual according to Curran was the fact that it was the public that initiated the petition, not the acupuncturists.

H 24: "Scientists usually switch from one set of guiding assumptions to a new set within a decade or so of the recognition of acute empirical difficulties with the

older set" (ibid., p. 169).

Hypothesis 24 is not supported using the data on acupuncture. If one believes that the biomedical model was first recognized in 1971 as having "acute empirical difficulties" in explaining the fact that acupuncture did appear to produce analgesic effects as well as therapeutic effects, then one can only conclude that the shift has taken much longer than 10 years to have occurred. It may be that shifts in the hard sciences occur within a decade but it is much more likely that in fields like medicine, education and the social sciences that shifts take decades or more especially in fields that have little or no theory at the outset.

H 25: There is only a small number of articles on non-Western medicine before a shift in paradigms, marked by a period of growth for 10 years.

The graphs for acupuncture (Figure 1) and Chinese-Traditional medicine (Figure 6) each depict a small number of articles for a number of years and then a period of steady growth. Nevertheless, it cannot be stated that the period of growth is limited to a ten year time frame. The sharp decline illustrated in Figure 6 may reflect the fact at the point the where the drop occurs, 1987, one sees the creation of a new MESH, Drugs, Chinese-Herbal (Figure 7). If one combines the data for Figure 6 with the data for Figure 7 one sees that the increase continues and, therefore, the period of growth is extended. The period of growth in the field of traditional medicine (Figure 10) may be used to support H25 but it is insufficient evidence to make the claim that all shifts occur within a ten year time period.

H 26: "During a change in guiding assumptions a few scientists accept a new set of guiding assumptions which foster rapid change, but resistance intensifies when change appears imminent" and that "four successive stages can be distinguished:

the formulation of the new set of guiding assumptions by a small group; the commitment to those assumptions; the dissemination to the wider scientific world; and the conversion of a significant number of scientists" (ibid., p. 170)

It appears that there is an emerging group of dominant proponents of non-Western medicine whose names appear in most of the journalists' reports. David Eisenberg, for example, has emerged as a leader. Murphy and Bonica, although they do not use the term "early adopters", describe how there was widespread enthusiasm for acupuncture in the early 1970s and McQueen actually designed a study to try and capture the dissemination of acupuncture as an innovation by tracking the number of references cited in indexes. The texts, however, do not contain enough information to test H26. Trawick (1987; Table 15, ex. 81) raises the following questions that further add to the complexity of testing H26:

> . . . one of the predictions that has been made of both science and culture, namely, that creative, productive scientific or cultural thought takes place on the boundary of a paradigm, at the frontier on which that paradigm loses its authority. . . One implication of this idea, whether mildly or strongly stated, is that people who somehow stand on the border can be expected to be more creative than others, to be more objective than others, to have clearer vision. . . . . Does the creative boundary of modern world civilization lie on the frontier of the future, on the cutting edge of scientific research, or does it lie on the periphery of centralized authority, among the fissures of the decaying empires of the past? . . . . Who are the people better able to understand what is going on around them, those who broach no challenge to their authority or to the ideology supporting it, or those whose authority and ideology are constantly challenged from outside and from above (pp. 1031-1032)?

H 27: The core group of authors with multiple publications accounts for the largest percentage of total publications.

Partial support for H27 can be found in the data obtained from a sort of all the authors who published articles on acupuncture. As acupuncture appeared to be the one area where there were clinical trials appearing each year indicating scientific testing

rather than simple overviews, an alphabetical listing of all authors who had published an article on acupuncture was generated. Of the 12,601 names on the list, 7,638 were unique. Of that list, 5,729 names appeared only once; 1,011 authors published a total of 2 articles each; 353 authors published a total of 3 articles each; and 543 authors published 4 or more articles. Those who published 4 or more articles accounted for 2,120 references or 39.78 percent of all the articles on acupuncture.

The question must be raised, nevertheless, regarding the validity of extracting names from a list based solely on the surname and initials provided by MEDLINE as in at least one instance, a correction appeared in *Lancet* noting that there was an error in the initials of one of the author's whose name appeared on the title page of the article. One particular error was noticed while spell checking author's names used within the literature review section of this manuscript. Patrice Jelliffe's name is misspelled as "Jeliffe" in the MEDLINE reference making it impossible for the computer to match her name to any other reference where her name may have appeared. As there is no way of knowing how many errors like this occur, using raw MEDLINE data is not recommended at this time.

In addition, one must ask whether or not it is fair to assume that authors who only use initials of the first and or middle names and journals that only publish initials are not inadvertently introducing what one might call "built in" error into the data. Garfield has addressed this issue whenever one criticizes the validity of the citation indexes. However, it is of major concern to any social scientist attempting to identify individuals who do not consistently use the same full name.

Using the data from above, assuming that the names that appeared on 4 or more articles are referring to the same individuals, 543 of the authors who published on

acupuncture accounted for 39.78 percent of all the references; however, one should not make any claims at this point until all the methodological issues have been resolved.

H 28: Appraisal of a theory "is sometimes favorable even when scientists do not fully believe the theory, specifically when the theory shows a high rate of solving problems" (ibid., p. 173)

H 29: Appraisal of a theory "depends on certain tests regarded as `crucial' because their outcome permits a clear choice between contending theories" (p. 173).

It is possible to support H 28 and H29 using the numerous passages in Table 15 that refer to the need for "clinical trials", "further testing", "better" designed clinical trials, "adherence to standardized testing", et cetera. Almost every author concludes that clinical trials are needed in almost area. Researchers in traditional medicine want more tests of the properties of medicinal substances and more field work and more cooperation and respect for local healers so that their knowledge can be preserved and verified. From the results in Table 12 of the preliminary study it is obvious that there are very few clinical trials, especially if one only counts those coded as "Clinical Trial. Journal Article". None appeared under "Clinical Trial. Phase I, II, III or IV".

H 30: Articles reporting on the medicinal and chemical properties of substances appear before clinical trials using those substances.

Unfortunately, the criteria, set *a priori* requiring that clinical trials must have been published in a refereed serial in order to be included, eliminated the majority of the articles classified as Drugs, Chinese-Herbal. Only 9 clinical trials classified under the MESH, Drugs, Chinese-Herbal, appeared in refereed serials. A print-out of all of the clinical trials revealed that the majority of the articles were tests of the validity of claims made about a particular Chinese herb in the treatment of a very specific disease

or medical condition. For example, Sandberg-Gertzen published a one page letter in 1993 in the *American Journal of Gastroenterology* coded as a "Clinical Trial. Letter." entitled "An open trial of Cedemin, a Gingko biloba extract with PAF-antagonistic effects for ulcerative colitis". As there is no abstract attached, it is not possible to summarize the findings without retrieving the article itself.

In contrast, Kong, Fang, Jiang, Zhai, O'Connell and Brewster published a randomized controlled trial in the *Archives of Diseases of the Child* in 1993 with a very short title, "Treatment of acute bronchiolitis with Chinese herbs". The names of the herbs do not appear in the title but are given in the accompanying abstract. In addition, the authors note in the abstract that the study was conducted with children. In this way it is possible to link the herbs *Shuang Huang Lian* to a specific medical condition, "acute bronchiolitis", in this case in children. Nevertheless, there is insufficient data in the titles and abstracts to test this claim without obtaining almost all the articles and clinical trials from a selected list of serials or without choosing in advance a specific herbal concoction. Once again, the limitations found in the otherwise rich MEDLINE data prevents the researcher from relying solely on the data provided by the National Library of Medicine.

H 31: In the early stages of science "results are reported in books that develop the subject from fundamentals and are addressed to both specialists and a larger public" (p. 177)

H 32: Television programs, magazine articles and books about non-Western medicine directed toward the general public appear in increasing numbers along with materials directed toward the more educated consumer in times of a scientific paradigm shift.

Numerous examples from Dow Jones Dowquest appear that support this claim. Articles detailing how to choose an alternative medical practitioner, how to judge the effectiveness of a therapy, how to evaluate one's family physician and how to educate oneself about being an active empowered patient have been appearing in almost every publication one wishes to examine. It is almost impossible not to find supporting evidence in every kind of general interest publication from the widely read *Reader's Digest* and *Prevention* to one's daily newspaper and Sunday supplement (e.g. *USA Weekend* December 30, 1994- January 1, 1995) containing profiles of alternative medical treatments as well as guidelines for educating the public. In addition, the nightly news has aired features from each subject area studied here. The previously mentioned television documentaries are also supporting evidence that there is a paradigm shift in progress.

Several specific examples support this claim. *Washington Post* journalist Mason, referring to the 1,068 page *Alternative Medicine: The Definitive Guide* by Burton Goldberg, writes:

> . . . . this is the book -- imperfect and controversial as it may be -- that is needed right now. It is needed, first of all, to get basic information out there, like what to do and where to go, to help sick people start thinking about, and learning, the many ways to access their own healing systems, their own mind/body intelligence, with and without surgery and drugs. It is needed as a starter course for mainstream physicians to learn about alternative medicine.

In addition to books, pamphlets and brochures on how to choose an acupuncturist as well as how to choose a doctor are published and distributed to the general public in every outlet one explores. Vanity press publications as well as ephemera are also proliferating, e.g. *Think Yourself Well: The Amazing Power of Your Mind* by Bernard Ward, published by Globe Digests, 1994. Material is supplied to potential customers

advertising both the potential beneficial effects of herbal remedies as well as warnings about their toxicity if taken improperly or if administered improperly. Numerous newspaper and magazine reports providing, in the case of the *Consumer Reports* example, a very detailed guide to choosing an alternative therapy and an alternative practitioner are listed in Table 16. As these examples accumulate they serve as more than sufficient evidence to state that H32 is confirmed.

H 33: Early work on non-Western medicine will be descriptive at first and progress through a series of stages similar to those documented by Koenig, Johnson and cited by Laudan, et al.

This statement is supported by not only the graphs on publication types on acupuncture but also by the content analysis of the articles concerning acupuncture. Clinical trials do not appear until 1971 and then only as the number of historical articles begins to decline. Much of the material prior to 1980 contains lengthy passages detailing the history of acupuncture, and the history of Chinese traditional medicine as a whole. Similar material appears on Ayurveda throughout the timeline as this area is still considered "new" and can be used to contrast the writings on Chinese medicine; *qigong* and *taijiquan* are an exception. These exercises, although clearly gaining in popularity as evidenced by Dunbar's survey results as well as articles in *T'ai Chi* (ISSN 0730-1049) and *Qi: The Journal of Traditional Eastern Health & Fitness* (ISSN 1056-4004), are still thought of as needing description. As a recent practitioner myself, I can testify that most of my *sifu*'s students are unaware and unfamiliar with the concepts and theory surrounding the Taoist philosophy embedded within these exercises concerning Taoist abdominal breathing, acupressure points, moving *qi* circles, et cetera. No study could be found, unfortunately, that uses this

rich sociological data one observes as the tenets are introduced to students who find such concepts quite alien because they do not have a background in Buddhist, Taoist, or Hindu thought.

The words of Gideon's (1977; Table 15, ex. 36), may be used here to support the claim that acupuncture, at least, is passing through stages as he provides the following summary:

> I do not advocate acupuncture therapy as a replacement for chemotherapeutic management of simple colic. However, the technique may prove to be a practical alternative or an adjunct to present methods. . . . Acupuncture has been scrutinized and accepted by many veterinarians and others in the medical profession and, therefore, deserves serious and objective evaluation of its merits. Acupuncture is not a panacea. Beneficial effects from its therapeutic use are being reported by veterinarians from clinical trials. Before widespread acceptance and usage of acupuncture by the veterinary practitioner, the technique should be thoroughly substantiated as being a useful clinical tool. Further research studies, both clinical and basic, are needed to answer some of the questions relating to safety, efficacy, and mechanisms by which acupuncture exerts its effects. Acupuncture principles have influenced the physician to consider more thoroughly the means of physical diagnosis and physiotherapy. It has also stimulated some physicians to seek alternative therapy for seemingly hopeless patients unresponsive to conventional therapy. Veterinary acupuncture should formally be considered as an experimental procedure until clinical efficacy has been demonstrated. If it can be shown to have merit as an adjunct to veterinary practice, acupuncture principles and theory will become part of the professional veterinary curriculum (p. 223).

H 34: Abstracts and articles at the beginning of a period of escalation will contain statements explaining the differences between non-Western and Western models which will disappear (what Merton labels the process of obliteration) either after a ten-year time period or after escalation levels off into a period of saturation.

The early material is filled with rather long definitions and descriptive passages outlining and/or detailing the history and techniques used in acupuncture. The material on traditional medicine, herbal remedies and Ayurveda do not have a point of

demarcation within the timeline. Shiloh (1968), writing on traditional medicine as practiced in the Middle East, provides a very lengthy description as do the authors outlining the principles of Ayurveda. Jagirdar (1989) details the five elements outlined in Table 4. Apparently, these topics are still considered to be "new" in that the authors do not feel that the general or even special interest reader is sufficiently grounded in the vocabulary and "textbook" knowledge of these topics to warrant the omission of background information. The case of acupuncture, however, is quite revealing as the works after 1989 no longer contain such passages and it is presumed that most authors now feel that their readers share enough knowledge that such material can be freely omitted.

An extremely rich example (Table 15, ex. 38) appears in a study by Terence M. Murphy, M.B., ChB, and John J. Bonica, M.D. from the Department of Anesthesiology and the Pain Clinic, University of Washington School of Medicine, Seattle, Washington in a 1977 historical/journal article in the refereed A.M.A. journal, *Archives of Surgery*. The following rather lengthy passage from Table 15 is presented here as there are several clauses and sentences that support several of the theoretical assumptions about science:

> After the war of liberation, Mao Tse Tung encouraged an integration of Western and traditional Chinese medicine. . . . . Thus, following the dramatic reports regarding acupuncture anesthesia in the People's Republic of China by B. Reston <note error - it's James Barrett Reston> (*New York Times*, Aug. 22, 1971, section 4, p. 13) and Diamond . . , who were among the first Americans to visit that country after a quarter of a century of closed-door policy, there developed an almost incredible degree of interest in acupuncture therapy and acupuncture anesthesia. This was accompanied by many misperceptions among the American public and many physicians about the true role of the procedure. The dearth of evidence did not permit reasoned scientific judgement as to the efficacy and mechanisms, but despite this, widespread false impressions developed among Americans about the claimed success of acupuncture. This was in part due to these early reports made by Americans, including some

> highly respected scientists who, though well-meaning, did not have the expertise to critically evaluate their observations.
>
> These misperceptions prompted a widespread interest in acupuncture and caused it to be practiced extensively by physicians, other health professionals, and "acupuncturists" in the United States and other Western countries. . . . some unscrupulous persons have exploited the public's interest by operating their acupuncture "centers" like "mills," treating several hundred patients daily and charging exorbitant fees. Moreover, the interest and curiosity of many physicians has been exploited by the numerous groups who have sponsored many courses and by a large number of acupuncture equipment companies that sell a variety of charts, needles, and "do-it-yourself kits." Outside of a few well-carried-out clinical trials, most of the "studies" reported in the recent Western literature are of an anecdotal and uncontrolled nature.
>
> Fortunately, further evidence was obtained during visits by official medical missions from several Western countries, including the United States, . . and subsequently, by the group of anesthesiologists and other scientists who visited China for an in-depth study of the use of acupuncture for clinical and other studies, now permit a more realistic appraisal of the phenomenon of acupuncture analgesia and anesthesia (p. 896).
>
> . . . . Reports by most early visitors to China gave the lay public and medical profession of the United States and other Western countries the impression that acupuncture anesthesia was being used widely for many, if not most, operations and was highly effective in most cases. . . . The claim that acupuncture anesthesia is effective in about 90% of the patients - a figure that has been accepted in a report by many other visitors to China - is also incorrect. This is based on the personal observations of Bonica . . and others . . (p. 899).

One can see from the above example that Murphy and Bonica take note that much of the "widespread" enthusiasm for acupuncture reported at the time was the result of "initial dramatic reports" concerning the successful outcome of Reston's operation, noting that Reston was "one of the first Americans" to be allowed into China after it had been closed for so long. There was in their estimation a "dearth" of information even though Kao (Ex. 11) had already demonstrated that there was more than enough readily available scholarly work to draw from as early as 1973. Several authors use the same word, "dearth", so it should be noted that information retrieval was then, and is still, a phenomenon that needs a great deal of study before one makes statements about the what might have caused so many physicians to perceive the

existing literature at that time as "scant".

Murphy and Bonica also attack the gullibility of the public and of health care professionals at that time, pointing out that the success rates were incorrect but were accepted at face value by most visitors. The authors' own words can also be used to support the claim that each field has its own "determining test" - in this case the clinical trial. Furthermore, Murphy and Bonica stress the fact that it was not until "official medical missions" had conducted "in-depth" studies that a scientist could make a "realistic appraisal" of the efficacy of any reported therapy. Reports by journalists and physicians on holiday could not be trusted.

Another passage in the article by Murphy and Bonica addresses the very issue of competing theories as they dismiss out of hand, without ever using the word "qi",

> The traditional explanation of restoration of energy for instance is not an acceptable explanation for contemporary understanding of acupuncture. This is somewhat akin to caloric and phlogiston theories as explanations of inflammatory processes and would invoke the existence of an alternative biological system other than those of conventional physiology and anatomy (p. 901).

Examples like this one can be used to pinpoint exact moments in time when specific sentiment was expressed and to track changes in attitude over time as the allegiance to a given paradigm breaks down.

H 35: "During, and *only during*, periods of agreement about guiding assumptions the primary unit of publication is the research article" (ibid., p. 165)

The primary unit of publication in medicine is the journal article; however, the clinical trial is actually the unit of publication that contains reports on the "crucial test" results needed to advance discussion on a particular drug or therapy. The majority of the articles are journal articles except in Medicine, Arabic where the

primary type of publication is the historical article. The overall number of clinical trials is quite small, only . . . out of 15,561 with the majority being tests of claims made about acupuncture. From Koenig's and Johnson's work on pharmacology, it would appear that during periods of agreement the number of clinical trials decline because the efficacy of the drug has been either been demonstrated or not. On the other hand, to conclude that because there are so few clinical trials on non-Western medicine, everyone is in agreement about its place in the biomedical model, is simply to misinterpret the process. Kuhn's model of paradigm change cannot be forced to fit all data even though it may on the surface appear to do so.

H 36: The majority of articles on non-Western medicine prior to a paradigm shift in biomedicine are historical reviews and review articles.

On the other hand, H36 can be shown to be confirmed by examining Figure 26 on the number of historical articles over time. The majority of articles on non-Western medicine are histories of acupuncture, outlines of all the ancient and medieval texts on Chinese-Traditional medicine, definitions and descriptions of the tenets of Ayurveda and Tibetan medicine and biographies of famous physicians in the Muslim world.

H 37: "In a fully developed science research results are reported to scientific societies, published in specialized journals, and codified in textbooks" (ibid., p. 177).

Support for the claim that research results are indeed being reported to scientific societies is found in the sample of articles obtained for content analysis and in the list of references generated to produce the sample. Over 100 articles classified under the broad heading of non-Western medicine have appeared in peer reviewed journals almost all of which were published by research societies. Specialized journals

on acupuncture, Chinese traditional medicine, ethnopharmacology and Ayurveda are have been founded since the early 1970s. There are numerous examples of textbooks on Chinese traditional medicine and Ayurveda found in mail order catalogs. One such catalog, produced by Wayfarer Publications in Los Angeles, California, contains textbooks on Chinese traditional medicine, as well as acupuncture mannequins, Baoding iron balls for stimulating the acupressure points in a user's hands, martial arts videos, and books on Taoist philosophy. *Qi* magazine also offers a similar product line. From these and other sources such as *Books in Print* one finds evidence that there are examples of "codification in textbooks"; nevertheless, one cannot fully support H37 until data is obtained on from medical schools listing the titles required for each course. Only when a list of the most frequently required texts is obtained and the texts themselves coded will it be possible to determine the validity of H37.

H 38: "Science textbooks, popularizations and philosophical discussions do not accurately report how changes in guiding assumptions came about. Specifically, they present only some of the relevant evidence as if it were all the evidence" (ibid., p. 188).

The Murphy and Bonica example used earlier can be used here to support H38 to some degree but the more compelling evidence comes from transcriptions of comments made in the television documentaries and news reports. The popularization of alternative medicine is very widespread. Press (1980; Table 15, ex. 51) points out that

> Some U.S. medical usages and intentions reveal strong adherence to the biomedical paradigm and its official proponents. Others reveal subtle dissatisfactions or developing needs and may skirt dangerously close to the limits of the paradigm. Indeed, new concepts and practices often enter medical systems via the popular sector, where the pressures for orthodoxy are weaker,

> and where peer, kin, ethnic and other local networks constitute the major sources of behavioral reference and anxiety relief (p. 49).

An excellent example can be found in the "Cured! Secrets of Alternative Healing" hosted by Olympia Dukakis that aired on July 5, 1994 on NBC. The 90 minute special presentation began with the disclaimer "The following program features vignettes of anecdotal accounts. The intent of this program is to explore available alternative medical treatments that may complement conventional medicine. It is not an endorsement of any specific approach".

Similar in format to other programs on secrets of the ancient pyramids, UFO sightings, UFO abductions, the search for the Lost Ark, et cetera, being aired on NBC, CBS and ABC this program presents "re-enactments" and "interviews" as evidence or proof of the producers' claims. Regardless of the simplistic treatment of alternative medicine, this program is a classic example of the popular media's biased coverage in favor of alternative medicine and it supports the claim here that popularizations and philosophical discussions do not accurately report how changes in biomedicine have come about. The few examples of the failures of biomedicine to treat specific cases along with the widespread sentiment that biomedicine is impersonal are presented as the only reasons why biomedicine is in crisis.

Even the news reports about university hospital programs being initiated to teach aspects of holistic medicine fail to address the broader issue of the philosophy of medicine. None of the magazine and newspaper profiles of the various therapies and herbal treatments contain discussions about the theories surrounding the new therapies except to give very brief overviews of the yin-yang and five elements model. Each ends with a standard warning that the patient must consult a licensed physician first

before pursuing any kind of alternative treatment. No program or publication was found to address the theoretical concerns of the biomedical practitioner other than the fact that physicians fear losing patients to competitors and the fear the American Medical Association always states that a patient may not seek treatment from a licensed physician soon enough and may suffer from "time wasted" seeking cures that have not be shown to be effective statistically.

Another example is seen in the promotional material received by the author whose name must be on a mailing list for such materials. Mountain Home Publishing uses testimonials and teasers to persuade the public to subscribe to *Alternatives*. Dr. David Williams, a former practicing clinician, states that he writes and edits the newsletter in order to reveal all the "special secrets regarding some of the most startling, little-known breakthroughs in health and healing you've ever seen . . . secrets which are being uncovered and confirmed by top scientists and medical researchers from around the world." Similarly, the actual remedies themselves are sold through the Maharishi Ayur-Ved Products International, Inc. catalog that outlines the vata, pitta and kapha body types as well as profiling satisfied customers. These and other examples abound and serve to support the claim that the popularization of non-Western medicine is widespread and that the public is not being told how this movement has evolved nor how the philosophical issues of paradigm change have yet to be addressed by the majority of health care providers and medical researchers.

H 39: "In an undeveloped field, advocates of one set of guiding assumptions criticize rivals, not by pointing to failed predictions, but by attacking their general plausibility" (ibid., p. 193).

H 40: Statements containing words or phrases labeling rival sets of assumptions as

nonsense, unscientific, etc. along with statements claiming that individuals or groups proposing research using the rival set of assumptions are quacks and their work is unworthy of scientific recognition will appear throughout the period of paradigm change.

The best example that supports H 39 and H40 appears in Kroger's (Table 15, ex. 15) acrimonious, sarcastic, caustic admonitions of dire consequences if one were to incorporate acupuncture into the biomedically based health care system going so far as to warn physicians that they could easily fall "liable to" allowing their professional standing to "become relegated to the status of faith healers" (p. 193). A few examples use the actual root word "quack", and others ridicule or dismiss the acceptance of the cosmological or philosophical foundations of Chinese Traditional Medicine, Middle Eastern medicine, Ayurveda et cetera. The word "quack", however, appears more often in the journalist's interviews as seen in Table 16 and in the Moyer's transcripts. Many others present the underlying assumptions of these non-Western systems using the voice of a disinterested ethnographer simply providing the reader with an overview of a medical system without passing judgement. Nonetheless, those who do attack do so with nothing less than hostile emotional intent.

Ironically, the example of the Burton Goldberg guide used to support H28 appeared in a story in an article on August 25, 1994 in the *New York Times* as the centerpiece of a controversy over First Amendment rights and censorship issues. Victor Herbert, a professor at the Mount Sinai School of Medicine, requested that officials at Ellis Island remove the book from an exhibit about immigrant health traditions. Herbert called the book a "quack book". In response, the officials had the book was removed from the exhibit and then ordered it taken off the shelf at the

museum gift shop. Presumably, many other such examples exist. It is just a matter of locating them using our current level of information retrieval methods. If, as many have predicted and few have funded, we do have full-texts of all published materials in the future, it will be possible at that time to state definitively whether or not there is insignificant, sufficient, or overwhelming evidence to support the claim that the debate within medicine has gone beyond the stage where one group still persists in labelling the other as quacks has ended.

H 41: "The transition to a developed science will be accompanied by the formation of specialized journals, societies and academic curricula" (ibid., p. 182).

Example 27 (Table 16), reporting on the three-day symposium on "Alternative Medicine: Implications for Clinical Practice" sponsored by the Continuing Education Department at Harvard Medical School and Beth Israel Hospital of Boston where 400 health care professionals attended lectures and discussions on traditional Chinese medicine and various forms of alternative medicine, supports the claim that academic curricula is being developed to address the issues of what might prove to be a new paradigm in medicine. Examples of the formation of specialized journals has already been presented in the preliminary study. Similarly, the data on the formation of new societies is emerging to add further support for H41.

The most compelling evidence, however, is found in the following example. In testing PH2 (Specialized journals will begin to appear to provide an outlet for authors whose work is rejected by or not readily accepted by existing journals.), it was noted that *Acupuncture & Electro-Therapeutics Research: The International Journal* (*AETR*) was one of the specialized journals that had appeared in the listings. In the process of photocopying articles from the bound volumes held at the Library of Science and

Medicine a mistake was made and the author had to return to the set to locate the article that had been selected. While the turning pages of the first article in the volume to verify that the correct volume had been pulled, the author saw the words "I had never before had a rejection nor such an unusual response". Further investigation revealed that although the reference did not have an abstract and the title "On the special occasion of the 40th anniversary of the founding of Pergamon Press: A brief historical background of *Acupuncture & Electro-Therapeutics Research. The International Journal* did not imply that it would contain the kind of material that it did, this one article contains passages that support most of Garfield's claims about the formation of specialized journals.

Omura 1988 writes that *AETR* was launched because he and his colleagues had

> . . . submitted a paper to one of the leading scientific journals. Within two weeks of the time of submission, we received a response that "since acupuncture is not considered to be part of science, the paper cannot be evaluated". I had never before had a rejection nor such an unusual response to one of my papers from any journal, and the findings had significant clinical implications, so I was quite shocked and realized that a new journal solely devoted to acupuncture and electro-therapeutics research was needed. Many other scientists had told me of similar difficulties they had had in publishing research papers on acupuncture, simply because of the use of that word. The lack of experience and background in acupuncture studies, as well as biased, preconceived, and erroneous notions concerning the field, seemed to me the main reason for the unwillingness of these referees to even evaluate acupuncture-related research. I showed the original manuscript to my esteemed friend, Dr. Alfred Copley, who was then Prof. of Medicine and Pharmacology at New York Medical College and who happened to be Editor-in-Chief of two Pergamon journals (Thrombosis and Biorheology), and he agreed that the use of the word `acupuncture' was the only possible reason for the editor's hesitance to evaluate the paper, as the entire study was undertaken with standard laboratory tests and established scientific procedures, and was submitted in standard scientific journal format. Dr. Copley also strongly concurred that this new scientific discipline--with a few thousand years of empirical history--should be seriously studied and developed, and every physician and patient should take advantage of its beneficial effects, particularly in areas where Western medicine has not been successful (p. 2).

This one example is so rich in content that it alone can support several theoretical assumptions and hypotheses. Garfield's example (cited earlier) of how new journals are formed is matched with Omura's account. The Matthew Effect[18] is evident in how a scientist uses his relationships with powerful, high-ranking scientists to confer on issues. Dr. Copley played an additional role, one that is a classic example of the kinds of findings made by Harriet Zuckerman in her studies of Nobel Laureates. Omura tells us that

> Many publishers were interested in publishing my book on acupuncture, but few were seriously interested in publishing a new journal in this field . . . In the summer of 1972, while the author was presenting a paper at a biophysics congress at Moscow University, one of the professors from New York had a severe pain in the neck and back and had been forced to wear a neck brace. He asked me to treat him with acupuncture. Dr. Copley witnessed the remarkable effects . . . Although this was his first direct observation of acupuncture treatment, Dr. Copley immediately recognized its clinical implications and strongly advocated research in the field. . . . Shortly after reviewing and evaluating my paper . . . Dr. Copley had promised to discuss my idea of creating a new journal devoted to acupuncture and electro-therapeutics with Mr. Robert Miranda of Pergamon Press, who was then Senior Vice-President in charge of the journal division (p. 3).

After a series of phone calls and meetings, Omura was invited to meet with none other than Robert Maxwell, the "flamboyant publishing tycoon" (*Almanac of Famous Persons)* who owned Pergamon at that time. This is an important point, for years later when *AETR* was about to be cancelled by Pergamon's middle managers for failing to make a profit, Omura was able to appeal to Maxwell. The title was continued. The marked passages from this one article need very little, if any, analysis. Dr. Omura's memoir-like account of how he was personally affected by the peer review system, how he took advantage of the ways in which scientists network with one another and with publishers, and how a famous personage interceded on his behalf, is a textbook example of the norms of science. Omura's account also supports

almost every theory of how scientific communication as well as international scientific communication can flow when all the right circumstances occur at the same moment in time.

H 42: "In transitions from one set of guiding assumptions to another, the successor generally will not be simpler than its predecessor" (Laudan et al., p. 202)

On the whole, no replacement of the biomedical model has yet to be proposed. Nevertheless, there is a movement in medical anthropology to develop a new model for studying medicine in society. This model is more complex than its predecessor.

Discussion

The analysis of the growth of the literature provides support for the claim that a scientific paradigm shift is underway but it has not yet had an impact on each of the nine areas identified by their MEDLINE subject headings. The passages coded in the sample set of articles do support each of the hypotheses, some to the degree that one cannot argue with the evidence as the authors' own words are more convincing than any researcher could have anticipated despite the fact that philosophers of science and historians of science using archival materials and interviews designed to elicit scientists' recall have stated in theory that such evidence exists. What was not really expected was that so much material could be found in the "official organs" of medical research societies.

Conclusion

Coded passages indicating that physicians and researchers first became interested in non-Western medicine in and around 1972 validate the use of bibliometrics in identifying periods of paradigm change. Passages also indicate that, up until recently, most physicians met with ridicule and their colleagues tried to

discourage their interest in non-Western medicine. Content analysis of the medical research articles themselves reveal a spirit of pioneer research. Articles from the 1960s and 70s are filled with travelers' reports of exotic sights as if the authors had encountered a new frontier and were exploring long lost civilizations filled with forgotten secret knowledge. Much of it is written with the view that the medical knowledge and techniques developed in other lands cannot be adopted into the West until Westerners have examined all the claims and conducted a series of "scientific" studies that meet their standards because everyone knows that native peoples do not have a tradition of disinterested scientific inquiry. This Orientalism has appeared in the literature for centuries. Only a few authors whose works are included in the data set try to put the phenomenon surrounding China's Open Door Policy and the rush to visit in perspective. One would need to look at the different market forces that generated the dissemination of information and subsequent demand for acupuncture, herbal medicines and Ayurveda that arose during the early 70s to determine which came first, but for the purpose of this study the texts themselves can be used to support several hypotheses.

Clearly a call for a shift in paradigms has appeared throughout the literature. Kleinman (1978) critiques the prevailing conflicts in medical anthropology and concludes that medical anthropology was undergoing a shift in paradigms as early as the late 1970s.

> The old research paradigm, built by Rivers, Sigerist, Ackerknecht, Clements, and other "founding fathers" of our discipline to conceptualize medicine in "primitive" societies, is simply no longer sufficient for integrating the more complex and sophisticated findings that are the result of an extension of our interest toward the full range of social contexts and medical systems, and toward a much wider set of concerns than the traditional biomedical issues in "medicine" . . (p. 89).

Another prominent author, Kao (1992), "envisages that the process of integration of all indigenous medicines of various cultures will end in the 21st century, at which time the "ecumenical medicine" . . . movement will not be necessary, for all forms of medicine will be one system" (p. 1). What percentage of the American Medical Association's membership, however, "envisages" the same process has yet to be answered.

Table 15
Coded Passages from Medical Literature

(period) . . = omitted footnote number or author/date note
. . . = parts of the sentence omitted
> . . . . < = entire sentence or paragraph or paragraphs omitted

1. Shiloh, Ailon (Associate Professor of Anthropology in Public Health, University of Pittsburgh, Graduate School of Public Health.) The interaction between the Middle Eastern and Western systems of medicine. Social Science and Medicine. September 1968; 2(3): 235-248; ISSN: 0037-7856.
Note: Refereed Serial; Preliminary paper read at the 57th annual meeting of the American Anthropological Association in November, 1958 and at a seminar *Health and Illness in a Cross-Cultural Perspective* at the Harvard School of Public Health in April, 1959. A Hebrew version of the paper was published in 1965 in *Bruit Hatsibor.*
Philosophy, Medical.
UI 72092387.

<BACKGROUND EXPLANATION OF RIVAL GUIDING ASSUMPTIONS> As had been detailed previously . ., the essential philosophy underlying the system of medicine in the Middle East is that illnesses and injuries are subjective affairs arising out of personal actions conducted or not conducted, or caused by someone or something possessed with a power. Illnesses or injuries do not just occur--they befall a certain victim, at a given time, and in a definite manner because of specific causal agents.<end> <POSTULATE> Evil spirits are always lurking ready to enter the body and consequently susceptible persons should never be left alone lest this be interpreted as a sign of abandonment to both patient and evil spirit.<end> <CULTURE; WELTANSCHAUUNG> It is clear that both patient and practitioner operate within a framework of knowledge, beliefs, and values which explain their respective actions.<end> <NEW PARADIGM DOES NOT REPLACE OLD> Very frequently, introducers of Western medicine have operated on the assumption that the successful implementation of their program is dependent upon the successful destruction of an existing native program.<end> <MISSIONARY APPROACH> They <=Westerners> have launched a frontal assault on local medical practices and have unwittingly attacked a medical system that is intimately interwoven with the social structure, religion, and values of the local culture. Western practitioners have discovered, to their surprise and sorrow, that such an assault is expensive, time-consuming, and laden with potential failure and tragedy.<end> <NON-WESTERN MEDICAL SYSTEM=COMPLEXITY> First, there must be the awareness that in the Middle East, as in every culture of the world, there exists a complex medical system of philosophy, concepts, and practices carried out by local socially-recognized medical practitioners in specific salubrious locations. Western-trained personnel must realize that when they attempt to introduce their medicine into another culture they are not moving into a vacuum.<end> . . . . <SUCCESS=TECHNOLOGY, SURGERY, ANTIBIOTICS> The success of most Western surgery and pharmacy is generally obvious even to a jaundiced Middle Easterner and accordingly, given a rational approach on the part of the Western medical staff, he will voluntarily accept Western curative medicine for the treatment of both the internal and external body.<end> . . . . <RIVAL SETS OF GUIDING ASSUMPTIONS DICTATE OPPOSING APPROACHES> . . . this is the essential point, both medical systems attack different aspects of the problem. Whereas Western medicine is very concerned with providing an accurate *diagnosis* of a complex of symptoms derived from the germ theory of disease, Middle Eastern medicine is essentially concerned with ascertaining the *cause* of a complex of symptoms based upon the concepts of the evil eye and the evil spirits. Both cultures consider preventive medicine to the internal body to be important, both are equally concerned with the problem, but each attacks it from a position derived from a different medical system.<end> <USE BUT CAN'T EXPLAIN = H13> If, with their <villagers> own eyes, they can see results that they recognize as beneficial to them, then regardless of their understanding of the reason, and notwithstanding local tradition and belief,

many persons will add to the old by accepting the new.<end> . . . <IMPLEMENTATION IF PRACTICAL> As one commentator <D. Apple> of this study has noted: "The villager is a pragmatist, not caring who is right but ready to use the method which seems to him to work, or to try both".<INTEGRATION> . . . . <KUHN= > The Middle East system of medicine has pragmatically examined, rejected, or accepted an integrated series of Western medical practices without necessarily understanding or accepting their rationale.<end>

2. Papper, E. M., M.D. (University of Miami, Miami, Florida). Acupuncture and pain [Editorial]. New England Journal of Medicine. August 21, 1971; 293(8): 401-402; ISSN: 0028-4793.
   Note: Refereed Serial; Massachusetts Medical Society; Coded by Medline as a "Clinical Trial. Journal Article.".
   UI 75216381.

   <BIAS> It is extraordinarily difficult for Western physicians and scientists to cope objectively in the intellectual tradition of controlled Western biomedical thought with assessing the value, if any, of the use of acupuncture in the management of chronic painful states.<end> . . . . <FAILURE OF BIOMEDICINE> In the treatment of many states with which Western medicine deals relatively inadequately, acupuncture has been accepted by the Chinese to be an effective remedy.<end> <TRAVELER'S ACCOUNTS> Numerous American visitors to the People's Republic of China have attested to its apparent usefulness.<end> . . . . <LACK OF UNDERLYING PRINCIPLE> The ineffectiveness of acupuncture in the control of pain in this study suggests once more that the management of pain in chronic conditions is susceptible for reasons that are beyond present knowledge and comprehension to treatments whose rationale is at best incompletely understood and in fact may really not exist. I strongly recommend that, when possible, other studies of this nature be encouraged so that the relevance of acupuncture to the management of chronic pain and other conditions can be delineated more sharply under Western conditions or its efficacy can be disproved.<end> . . . <USE BUT NOT UNDERSTAND = H13> Left suspended for judgment is the clinical validity of the use of methods of treatment that "help" patients regardless of their empirical nature. Should one use methods of treatment that seem to provide help even though one does not understand them?<end>

3. Shiang, Elaine; Li, Frederick P., M.D. The yin-yang (cold-hot) theory of disease. [Letter to the editor.] JAMA: Journal of the American Medical Association. August 23, 1971; 217(8): 1108; ISSN: 0098-7484.
   Note: Refereed Serial; American Medical Association.
   Coded by Medline as a "Journal Article".
   UI 72036002.

   <IMMIGRATION> . . . highlights the influence of folk medicine on United States patients from Latin America . . . . Our experiences with the care of Chinese patients in Boston reveal that many adhere to Chinese medical teachings and have a poor understanding of Western medicine.<end>

4. Dimond, E. Grey, M.D. (University of Missouri, Kansas City.) Acupuncture anesthesia: Western medicine and Chinese traditional medicine. [Journal Article]. JAMA: Journal of the American Medical Association. December 6, 1971; 218(10): 1558-1563; ISSN: 0098-7484.
   Note: Refereed Serial; American Medical Association.
   UI 71277580.

   <TRAVELER'S ACCOUNT> In September 1971, Paul Dudley White, myself, and our wives were invited to the People's Republic of China by the China Medical Association.<end>. . .<INTEGRATION> The attempt to merge the two systems <TCM and Western> is now fully underway. . . .It is important to understand that this is not simply a polite accommodation but a political requirement.<end> <MARKET FORCES=SEARCH FOR MARKETABLE PRODUCTS AS AN OUTCOME> They <=staff working at the Institute of Materia Medica of the Chinese

National Academy of Science> are working with the traditional doctors on the one hand, and the pharmaceutical companies on the other, to analyze and identify active ingredients in the immense array of traditional drug treatment, and when indicated to get a calibrated, identified product on the market.<end>. . . <TEXTBOOK KNOWLEDGE> All of us can cite Ma Huang and ephedrine as examples of a Chinese herb and its active ingredient <end>. . . .<SKEPTICISM> One can only hope that the scientific skepticism of Western medicine acts as a filter and that adequate data accumulate for documentation <=EXTERNAL FACTOR IMPACTING SCIENTIFIC COMMUNICATION; POLITICAL> . . .publication of all Chinese medical and scientific journals has been suspended for a number of years, and national science communication has not yet found a new pattern.<end>. . . .<RIVAL SETS OF GUIDING ASSUMPTIONS ABOUT TESTING THE EFFICACY OF A THERAPY> Another control factor is that by government rule, and professional discretion, all herbs and needling methods must be tried first and adequately on the prescriber himself.<end>. . . . <=LIMITATIONS> Acupuncture anesthesia was least satisfactory when used in abdominal surgery because traction upon the viscera might produce definite uneasiness and, also, strong abdominal muscles did not become sufficiently relaxed <ABDOMINAL SURGERY> . . . <PATIENT FACTOR> If the patient was very tense and frightened, they simply went ahead with a general anesthetic because it was not fair to the patient to have him alert and conscious during the surgical procedure.<end>. . . <COMPETING SETS OF GUIDING ASSUMPTIONS> The method <ACUPUNCTURE ANESTHESIA> was being used in every hospital in China by literally thousands of physicians and upon hundreds of thousands of patients. Did we think everyone was hypnotized?<end>. . . .<SKEPTICISM> Dr. Chou said that he, as well as practically every Western trained physician that he knew, had been thoroughly skeptical of acupuncture anesthesia and had thought that it was essentially a hoax <=QUACKERY>. <ACCEPTANCE OF RIVAL PARADIGM DEPENDENT UPON FIRST HAND EXPERIENCE WITH ITS SUCCESS> It was only after repeated personal clinical experiences that he became convinced.<end> . . . . < > He <Dr. Chou> believes that it <ACUPUNCTURE ANESTHESIA> is simply a method that Western physicians must now recognize <SUCCESS HAS BEEN DEMONSTRATED - CALL FOR CONVERSION> and that the results of basic research explaining the rationale would be available soon.<MECHANISMS NOT UNDERSTOOD; EXPECTATIONS FOR FUTURE SUPPORTING THEORIES> . . . <CLINICAL TRIALS = KEY TESTS> . . . this immense ongoing applied clinical research may bring useful surprises to the rest of the world. <INTERNATIONAL DISSEMINATION AND ADOPTION><end>

5. Koran, Lorrin M., M.D. (Special Assistant to the Director, National Institute of Mental Health, Rockville, MD). Psychiatry in mainland China: History and recent status. [Historical Article. Journal Article.] American Journal of Psychiatry. February, 1972; 128(8): 970-977; ISSN: 0002-953X.
Note: Refereed Serial; American Psychiatric Association.
UI 72102303.

<TRAVEL> With the likelihood growing that American psychiatrists may soon travel to mainland China, it is important to review and summarize for such travelers and others interested in non-Western psychiatry the information available in English regarding mainland Chinese psychiatry.<NEED FOR BACKGROUND INFORMATION> <LACK OF PUBLISHED RESEARCH IN THE EARLY STAGES OF SCIENCE> The small number of references appended to this article indicates the limited nature of our knowledge.<LACK OF KNOWLEDGE OUTSIDE CHINA>. . . <BACKGROUND EXPLANATION OF RIVAL GUIDING ASSUMPTIONS > The ancient Chinese use of dreams in diagnosis had its parallels in the practices of Mesopotamians . . Greeks, Hittites, and certain American Indians . . In reaching a diagnosis, the doctor took into account not only these observations, but also the patient's state of mind, the influence of the weather and season, the time of day, and the locality. <CHRONOBIOLOGICAL THEORY>. . . . <LIBRARY HOLDINGS - LACK OF = ACCESS> Neither of these works <*General Treatise on the Causes and Symptoms of Diseases*; *Tso Chuan*>

is available in the U.S. National Library of Medicine. . . . . <SHARED THEORETICAL TRAINING> . . a number of native Chinese psychiatrists had studied in the United States or other Western countries, and the influence of Adolf Meyer's teachings was high . . Psychological thinking and practice were heavily influenced by Dewey's functionalism . . . by pragmatism . . . After the Revolution, psychological and psychiatric theory and practice were brought into line with Marxist-Leninist thought and the teachings of Mao Tse-tung . . . . <SCIENTIFIC COMMUNICATION> The official professional organization of psychiatrists is the Chinese Society of Neurology and Psychiatry (Chung-Hua shen Ching Ching shen k'o Hsüeh huis Peiping shen Ching ching shen k'o hsüeh hui) every two months, with summaries of the main articles in English . .However, only some issues from volumes two through five (1956 through 1959) are available at the NLM <LIBRARY HOLDINGS>, and these are primarily on microfilm <BARRIERS TO EASY ACCESS>. <end> . . . . <TRAVELER'S REPORT=OPINION LEADER> Edgar Snow . ., reporting on his 1970 travels through China . . . . <end> <REVIEWS> Cerny . ., who reviewed summaries of papers by Chinese authors in English, Russian, and German along with papers on Chinese psychiatry by primarily Eastern European authors, mentions . . . <end> . . . <LITERATURE REVIEW> In reviewing the copies of *Acta Psychologica Sinica* available in the NLM, I <=Koran> noted studies on . . . . <end> <HEADING> Suggested Areas of Attention for Travelers to China <end> <PRESCRIPTION FOR SHARED TRAVELER'S ACCOUNTS> The psychiatric traveler fortunate enough to visit mainland China could do a great service if, in addition to recording his <note lack of recent use of his/her> personal experiences and anecdotes, he <no she used in 1972; assumed male dominated profession = gender issues in scientific communication> would systematically collect information such as the following . . . . <end>

6. Li, Frederick P., M.D. Traditional Chinese medicine in the United States. [Letter to the Editor]. JAMA: Journal of the American Medical Association. May 22, 1972; 220(8): 1132-1135; ISSN: 0098-7484.
   Note: Refereed Serial; American Medical Association.
   Coded by Medline as a Journal Article.
   UI 72185790.

   <BONE SETTING; DIFFERENT PARADIGM> Fractures in China were set with lightweight, flexible splints, and the use of bulky plaster casts were regarded with some suspicion by Chinese patients.<end> <INTEGRATION> Rheumatism, stroke, sprains, and gastrointestinal symptoms are considered to be responsive to treatment with Chinese medicines. Cancer is regarded as resistant to all treatments, and those affected may vacillate between the Chinese and Western methods of therapy. . <end>

7. Veith, Ilza, M.D. (Professor and Vice-Chairman, Department of the History of Health Science, San Francisco Medical Center, University of California). Acupuncture: Ancient enigma to East and West. [Editorial]. American Journal of Psychiatry. September 1972; 129(3): 333-336; ISSN: 0002-953X.
   Note: Refereed Serial; American Psychiatric Association.
   Coded by Medline as a "Historical Article. Journal Article. Philosophy, Medical [History].
   UI 72261652.

   <First use of enigma in title>
   <DEFINITION> Acupuncture, the ancient Chinese therapeutic method of inserting needles into a number of precisely designated points all over the body, the head, and the extremities, <SUDDEN PUBLIC INTEREST> has suddenly burst into remarkable prominence in the Western world. <PUBLIC INTEREST> Impetus for this interest was triggered with the lifting of the bamboo curtain <POLITICAL BARRIER; EXTERNAL FACTOR> and gained ever greater momentum after visits to China by American scientists, <SCIENTIFIC CROSS-CULTURAL EXCHANGE> ping-pong players, <INTERNATIONAL SPORTS=EXTERNAL FACTOR> and Asian scholars;

<SCHOLARLY CROSS-CULTURAL EXCHANGE> by James Reston's <RESTON = OPINION LEADER> much-publicized <MEDIA REPORTS> appendectomy; a study trip of selected physicians; <MEDICAL FACT FINDING TRAVELS> and finally, by the visit of the Presidential party. <WIDELY PUBLICIZED POLITICAL EVENT> <ANOMALY> The one aspect of acupuncture that seemed to arouse the visitor's attention more than anything else was its use in the induction of anesthesia deep enough for the performance of abdominal <CONFLICTING REPORT ON ABDOMINAL SURGERY>, thoracic, and brain surgery. <INSUFFICIENT KNOWLEDGE> Few of the Western observers of major surgery with acupuncture anesthesia may have been aware that it was only this aspect of acupuncture which was new and that . . . <end>. . . . <BACKGROUND EXPLANATION> According to traditional Chinese medicine, pathological conditions in most internal organs are due to dyscrasia of the life force (*ch'i*) <*qi*> and are reflected on specific parts of the skin; therefore the needling of these points must have a healing effect as it brings about homeostasis <AUTHOR'S ATTEMPT TO FIND EXPLANATION WITHIN HIS OWN PARADIGM> <end> <ANOMALIES AND INSUFFICIENT INFORMATION> In our opinion *Ching lo* <= MERIDIAN SYSTEM> may not necessarily be a system by itself, because the functions of the various systems in the human body are very complex <COMPLEXITY VERSUS MECHANISTIC REDUCTIONISM> and our present knowledge of them is very limited and incomplete.<end> <RIVAL SETS OF GUIDING ASSUMPTIONS USED SIMULTANEOUSLY = H10> Thus it is evident that the Chinese researchers and physicians, be they "barefoot doctors" or scientifically trained and oriented, are willing to employ a mode of ancient therapy that cannot as yet be fully explained in terms of Western science, even though they seem to have their reservations about the validity of the traditional rationale.<end> . . . <RIVAL SETS OF GUIDING ASSUMPTIONS USED SIMULTANEOUSLY = H10> Although Western medicine has adopted some therapeutic measures such as electroconvulsive shock treatment and more recently "barbotage" for analgesia even though the mode of action has remained unsolved, it seems probable that the adoption of acupuncture will be deferred by the American medical profession <UNSTATED REFERENCE? TO THE A.M.A. = PERCEIVED COMMUNITY OF RESEARCHERS> until scientists <=PRIESTHOOD; EXCLUSIVE MEMBERSHIP = OPINION LEADERS> understand the rationale <DOCUMENT UNDERLYING MECHANISMS> behind the Oriental treatment. Besides, the adoption of acupuncture requires not only scientific conviction <ACCEPTANCE OF GUIDING ASSUMPTIONS> but also the kind of training and skill for its execution <HIGHLY SPECIALIZED SKILL> that can rarely be obtained outside the Far East <GEOGRAPHIC BARRIERS>.<end> <ANOMALY> Whether the cure of these afflictions is also dependent upon the system of meridians <MERIDIAN SYSTEM> will remain unknown until the enigma of acupuncture is solved to the satisfaction of the scientists of the East and the West.<end> <OPINION LEADER; CONDITIONS FOR RECOGNITION OF AUTHORITY> *Editor's Note*: Dr. Veith, . . . , was invited to write this editorial because of her reputation as a medical historian and especially because of her extensive knowledge of Chinese medicine, which has recently been receiving wide attention in the medical and lay press. Dr. Veith's translation of *The Yellow Emperor's Classic of Internal Medicine* is considered a model of scholarly undertaking; the original manuscript consisted of 44,000 ideographs, which amounted to about 120,000 words when translated.<end>

8. Brody, Howard (College of Human Medicine, Michigan State University). Chinese vs. American acupuncture [Letter to the Editor]. New England Journal of Medicine. October 5, 1972; 287(14): 724-725; ISSN: 0028-4793.
   Note: Refereed Serial; Massachusetts Medical Society.
   Coded by Medline as a "Historical Article. Journal Article.
   UI 72265960.

   <Debate> *To the Editor*: In his letter, "Osler, Acupuncture, and Lumbago" . . ., Dr. Luis Fernandez-Herlihy dubs Sir William Osler the "pioneer North American acupuncturist" and notes that Osler recommended acupuncture for lumbago 50 years before the Chinese Great Leap

Forward. In deference <=dissenting opinion framed in polite tone> to both Sir William and Chairman Mao, it might be of interest to compare Osler's acupuncture with the Chinese variety.<end>

9. Joffe, Bernard, M.D. (Northern Westchester Hospital). Osler revisited: Imperfect acupuncture [Letter to the Editor]. New England Journal of Medicine. October 5, 1972; 287(14): 725; ISSN: 0028-4793.
Note: Refereed Serial; Massachusetts Medical Society.
UI.

<INITIAL FAILURE OMITTED> Perhaps it is easy to understand why Sir William repressed this memory when he came to write his great textbook.<end>

10. Man, Pang L., M.D.; Chen, Calvin H., M.D., M.Sc. Mechanism of acupunctural anesthesia: The two-gate control theory. [Historical Article. Journal Article.] Diseases of the Nervous System. November 1972; 33(11): 730-735; ISSN: 0012-3714.
Note: Non-Refereed Serial.
Models, Neurological.
UI 73131242.

<EXTERNAL EVENT> Since the opening of a crack in the Bamboo Curtain, the ancient Chinese method of acupuncture as a means of treating physical and mental illness and especially of alleviating pain of surgical operations has caught the attention of the world. However, a satisfactory explanation <PARADIGM> of its mechanism of action is still lacking. Various theories <RIVAL SETS OF GUIDING ASSUMPTIONS> have been advanced but none is acceptable <INSUFFICIENT DOCUMENTATION> even to the proponents themselves <ADHERENTS TO THE RIVAL SET USE BUT CANNOT EXPLAIN = H13> After an extensive review of the Chinese and Western medical literature <LITERATURE REVIEW> plus some personal training and experience of one of the authors (PLM), <CHINESE IMMIGRANT?; CHINESE ANCESTRY?; FAMILY AND CULTURAL TIES=ACCESS> we feel that there are sufficient facts to support a theory which we are proposing to explain acupunctural anesthesia from a scientific point of view. <EXPLANATION OF ONE RIVAL SET OF GUIDING ASSUMPTIONS BY ANOTHER = H11> <end> . . . . <ORIENTALISM; FADS; RIVAL SETS OF GUIDING ASSUMPTIONS APPEAR OVER TIME> The history of acupuncture may be compared to the hemline of a woman's skirt--it rises and falls.<end> . . . . It <acupuncture> was openly repudiated by Chinese health officials. It is only within the last 20 years and through vigorous promotion <PROPAGANDA> by the Communist Government <EXTERNAL POLITICAL FACTOR> with such slogans as "Chinese medicine and pharmacology is a great treasure house" . . that Chinese medicine began to emerge as a prominent and respected school. It has been raised to the level of the Western school, and Western technology has been used to investigate various Chinese medical procedures, especially herbs and acupuncture, with fruitful results. In spite of the extensive use and study of acupuncture in the People's Republic of China, little was known of it in the Western world because of lack of free communication, <BARRIERS TO SCIENTIFIC COMMUNICATION> particularly during the past six years <1966-1972=CULTURAL REVOLUTION> <end> . . . <FIRST USE> The first application seems to have been in 1958 for a tooth extraction by insertion of a needle into *"hoku"*,. . . <end> <MEDIA ATTENTION> The entire world is fascinated with and interested in acupuncture, especially acupuncture anesthesia <ANOMALY> <end> . . . . <LACK OF UNDERLYING THEORY> The Peking Acupunctural Anesthesia Coordinating Group believes that meridians <MERIDIAN SYSTEM> and nerves are interrelated but are unable to explain how.<end> . . . . <CONFLICTING THEORIES> ". . . , the theory of Chinglo concerning the connection between various parts of the body cannot be explained entirely by our present knowledge of neuroanatomy and neurophysiology . .".<end> . . . . <LACK OF KNOWLEDGE> Yet none of these satisfactorily explain the many known facts about pain including input control and central

summation.<end> . . . . <RIVAL SETS OF GUIDING ASSUMPTIONS EXIST SIDE BY SIDE> It is to be noted that intensive research in acupunctural anesthesia in the East and pain physiology in the West has been going on simultaneously since 1965.<end> <LANGUAGE BARRIER; POLITICS> Owing to a communication gap, they were not aware of each other's work.<end> <EXAMPLE OF FAILURE TO COMMUNICATE> The Chinese state that they "do not yet have a completely objective method of reflecting pain" . . evidently not knowing that such a method has been devised by Notermans . . <end> . . . . <NO PRECEDENT IN THE WESTERN MEDICAL RESEARCH LITERATURE> The Western literature certainly has not been reporting acupunctural anesthesia until recently.<end> . . . . <RIVAL EXPLANATIONS> We believe that East and West have been stimulating the same thing, i.e., the peripheral nerve fibers, to relieve pain but explaining it on a different basis.<end> . . . . <TOOLS CANNOT DETECT> The meridian theory <MERIDIAN SYSTEM> cannot stand the scrutiny of our knowledge in neuroanatomy because there are no such ducts detectable even with the electron microscope <SEE WORK BY OMURA IN THE 1990s> <end> . . . <EXPLANATION> Briefly, the way the acupuncture needle is used stimulates only the A-beta non-pain fibers causing the gates in substantia gelatinosa of the spinal cord and the thalamus to be closed, thus preventing the passage to the brain of any pain sensation coming in through the C fibers.<end>

11. Kao, Frederick F. (Department of Physiology, State University of New York, Downstate Medical Center, Brooklyn, New York). China, Chinese medicine, and the Chinese medical system [Historical Article. Journal Article]. American Journal of Chinese Medicine. January 1973; 1(1): 1-59; ISSN: 0090-2942.
Note: Philosophy; Institute for Advanced Research in Asian Science and Medicine.
UI 74087861.

<DETAILED HISTORICAL DOCUMENTATION; OUTLINE OF CURRICULUM; PHOTOS> <TRAVELER'S ACCOUNT> The rediscovery of China by Henry Kissinger in 1971, exactly 700 years after Marco Polo's original four-year journey from Venice to Peking, will perhaps be remembered by future historians as one of the most important cultural and political events of the 1970's, not to be outshadowed by moon-walks or nuclear detente.<end> . . . <CROSS-CULTURAL EXCHANGE> Furthermore, it has brought home to us the realization that there are many alternative ways of life, philosophies and beliefs which have a validity equal to our own, and that although they come cloaked in the unfamiliar guise of foreign lands and distant cultures, they quickly become familiar and clear to us because they are alternative answers to the same questions which men have asked in all ages and cultures.<end> . . . . <CURIOSITY> Chinese medicine including acupuncture has caught the fancy of Westerners, professional and layman alike.<end> . . . . <TRAVELER'S ACCOUNTS> The report by Chen and Ha in 1971 during their visit to Canada <CHINESE VISITING NORTH AMERICA> . . . <end> . . . <LITERATURE> . . . , it is also no secret that there now exists a vast literature concerning recent research into Chinese medicine and acupuncture in the West and East.<OPPOSITE VIEW TO MOST EXPRESSED IN EARLY 1970s> Many publications concerning recent innovations in Chinese medicine have, for example, been issue in China . . . . . In order to make sense of Chinese medicine as a whole, we must consider both the ancient and modern together, that contemporary developments and writings, which are written in the vernacular <LANGUAGE ACCESS> of the international scientific community, perhaps have even a greater applicability to the state of world medical knowledge, than the ancient and arcane Chinese texts . . . The fact that many contemporary writers on the subject of Chinese medicine and acupuncture have chosen to dwell upon ancient concepts and texts is a mixed blessing.<end> . . . . <TRAVELER'S ACCOUNT> In August of 1972, I had the good fortune to see China first-hand.<end>

12. Liang, Matthew H., M.D., M.P.H.; Eichling, Philip S., M.Th., M.D., M.P.H.; Fine, Lawrence J., M.S., M.D., M.P.H.; Annas, George J., J.D., M.P.H. Chinese health care: Determinants of the system. American Journal of Public Health. February 1973; 63(2): 102-110; ISSN: 0090-0036.
Note: Refereed Serial; American Public Health Association.

UI 73084639.

<ORIENTALISM> Many areas of Chinese life remain mysterious to Westerners.<end> . . . <POLITICAL FACTORS; PROPAGANDA; NAIVETÉ> Model stories of cures due to the thoughts of Mao--the equivalent of medieval morality plays in intent and function--have been interpreted all too literally by observers.<end> <CROSS-CULTURAL EXCHANGE> The high traditional forms of Chinese medicine, particularly herbal medicine and acupuncture have been rediscovered without attention to the critical question of why these forms were fused with the modern health care delivery system in the first place.<end> <SCIENTIFIC COMMUNICATION> Moreover, the Cultural Revolution <EXTERNAL FACTOR> has made much material obsolete. Scientific journals, for example, are no longer published, propaganda teams play a major role on every level of the health care system and the formal public health system from the Ministry of Health on down has been disrupted and continues in a state of flux.<end> <LITERATURE REVIEW> Both our analysis and the references that follow are meant to provide an introductory background for the general medical reader and medical visitors to China so that they may be prepared to maximize their experience and add to our meager knowledge <LACK OF KNOWLEDGE> of this subject.<end> . . . . <MANDATES; MERIT> The *Chou-li* outlined a system whereby imperial physicians and physicians of the common people were examined annually and graded according to their skill.<end> . . . . <GOVERNMENT POLICY AGAINST TRADITIONAL MEDICINE> The conflict was dramatized in 1929, when the Ministry of Health attempted to pass a resolution <Note some authors have written that the government had indeed outlawed TCM whereas more scholarly work, (Hongjun 1991) is absent from the early writings> to abolish traditional medicine altogether and was resoundingly beaten down by an ad hoc committee of traditional doctors.<end> . . . . <SKEPTICISM> The lack of unbiased data or reliable statistics necessarily precludes this . . . . These observations point to the limitations of our understanding. It is difficult to accept completely the reports of an ideal, crimeless, disease-free state as it is to listen to the critics, who denounce a program which is reaching the Chinese masses on a scale never before seen. One final warning should be sounded. It is tempting to see China as a model for health care delivery in developing countries. It is hoped that this paper might indicate the limitations of this view.<end>

13. Stanley, Margaret, R.N., C.N.M., M.P.H. (Public Health Nurse, Parent Child Center Demonstration Project, Minnesota Department of Health, Minnesota). Two experiences of an American public health nurse in China: A quarter of a century apart. [Historical Article. Journal Article.] American Journal of Public Health. February 1973; 63(2): 111-116; ISSN: 0090-0036.
Note: Refereed Serial; American Public Health Association.
UI 73084640.

<TRAVELER'S ACCOUNT> In 1972, I spent three weeks, from May 6 to May 27, in the People's Republic of China as a member of an eleven-person delegation of the American Friends Service Committee. Our aim was to exchange information with Chinese on many levels about our respective ways of life and to renew contact with those who remembered our work there <Stanley had worked in China from 1956-1948> <end> <FIRST HAND WITNESS REPORT> In the Peking Maternity Hospital, I watched a Caesarian section and a tubal ligation -- both under acupuncture anesthesia . . . . remove of an ovarian cyst the size of a grapefruit, under acupuncture anesthesia . . . . lobectomy under acupuncture anesthesia . . . At incision, gauze soaked in herbal solution applied to the edges of the incision acted as hemostasis instead of clamps.<end>

14. Alexander, Roger E., DDS. Acupuncture: Ancient art, modern enigma [Journal Article. Review.] American Dental Association Journal. April 1973; 86(4): 813-816; ISSN: 0002-8177.
Note: Refereed Serial; American Dental Association.
UI 73149220.

<Second use of enigma in title>

<METAPHOR=SCIENCE FICTION> The day may come when a dentist will insert needles into his patients' hands before he begins the dental treatment. A scene from a science fiction movie? Not necessarily.<end> <PUBLIC INTEREST> Western medical and scientific communities have recently witnessed a proliferation of interest in the ancient Eastern art of acupuncture.<end> . . . <BIAS> It is difficult to retrieve authoritative and unbiased information from the sparse literature <INSUFFICIENT LITERATURE> on this subject, and a great deal of speculative opinion conjecture is evident.<end> . . . <CURIOSITY> I claim no special expertise or personal experience in the field of acupuncture, only scientific interest and curiosity.<end> . . . . <DISSEMINATION; PUBLIC INTEREST> In recent years, new concepts have arisen and the interest in acupuncture has spread to the USSR, England, and more recently the United States. Acupuncture is now part of the medical curriculums <CURRICULUM> in China, Japan, Southeast Asia, Korea, USSR, and in many locations in Europe.<end> <RESEARCH SOCIETIES> Many local acupuncture societies exist around the world.<end> . . . . <BARRIERS; TRAINING> The choice of points is crucial and exacting, and the learning of these points requires extensive practice and training.<end> . . . . <CURIOSITY> With the revitalization of the interest in the clinical successes <CLINICAL SUCCESS> of acupuncture has come curiosity about why and how the technique works.<end> . . . . <ALLEGED/SUPPOSEDLY=SKEPTICISM> . . . one Korean physiologist allegedly has demonstrated . . . Russian investigators supposedly have followed . . . <end> . . . . <PERSONAL KNOWLEDGE; REPLICATION> To my knowledge, these findings have not been well documented or substantiated by others.<end> . . . . <HISTORICAL PRECEDENT> He <=Wall> also recalled that surgical mesmerism was widely practiced in English hospitals 100 years ago . . . <end> . . . . <DEBATE> Chinese physicians, acupuncturists, and some hypnotists deny this allegation. <=ACUPUNCTURE IS NOTHING MORE THAN HYPNOSIS> They point out that the technique is used for thousands of patients by as many doctors, with no prior meetings or discussion. Chinese doctors cannot explain the pathophysiology of acupuncture, but quickly add that we do not know how aspirin works.<end> . . . <ALLEGEDLY/CLAIMS> Two patients allegedly . . . . The author claims . . . <end> <SKEPTICISM> Skeptics say that the effects of acupuncture are at least partially hypnotic, but it is difficult to argue with success.<end> . . . . <GOVERNMENT OPPOSITION> An acupuncture center in New York City enjoyed a brief flurry of activity until it was closed by the New York Educational Department.<end> . . . <CURRICULUM> At least one American university offers a 14-week noncredit course in acupuncture.<end> . . . <CRUCIAL TESTS> Meanwhile, I join others in eagerly awaiting the results of future inquiry and research.<end>

15. Kroger, William S., M.D. (Executive Director, Institute for Comprehensive Medicine). The scientific rationale for acupuncture analgesia [Journal Article.] Psychosomatics: The Official Journal of the Academy of Psychosomatic Medicine. July-August 1973; 14(4): 191-194; ISSN: 0033-3182.
Note: Refereed Serial; The Official Journal of the Academy of Psychosomatic Medicine.
UI 74309242.

<RATIONALE> Leading scientists in the Oriental and Occidental world have no rational scientific explanation for the effectiveness of acupuncture.<end> . . . <SUCCESS> However, the fact that over 500,000 successful operations have been performed in China during the past twelve years requires rigid scrutiny.<end> . . . <TRAVELER'S ACCOUNTS> The latter studies were based upon reports of Western scientists visiting China, . . the official films of the Chinese People's Republic <PROPAGANDA> and the available translated Chinese literature. <SCIENTIFIC COMMUNICATION; LANGUAGE BARRIERS><end> <FIRST HAND ACCOUNTS> I also have observed acupuncturists in the Orient who used it primarily for medical conditions.<end> <PARADIGM> Significant antecedent, intervening and dependent variables indicate that A.A. <=acupuncture anesthesia> can best be understood within the paradigm of contemporary conditioning theory. . . . The reasons why even highly respectable scientist-observers of the surgical procedures in China did not place A.A. into this framework is

two-fold. First they were not familiar with the powerful effects shaping and modifying behavior of the masses. Second, with few exceptions, they did not recognize that prior indoctrinations could enhance suggestibility and/or hypnotizibility . . . <end> . . . . <MAO CULT> Mao's sociopolitical exhortations which are part of Chinese life induce an exquisite receptivity to mold the thinking of the masses. Thus, acupuncture is closely related to Skinner's operant conditioning and can, in part, be explained within this context.<end> . . . <RIDICULE> The ritualistic-like placement of the needles has merely supplanted the verbal and non-verbal suggestions used by hypnotherapists. . <end> <REJECTION> Since there is no proven rationale for the meridians or spots, <MERIDIAN SYSTEM> this is an added fill'sp <?> to subtle conditioning of the patient. <QUACKERY> Is this not similar to phrenomagnetism, Zoroastrianism and other spiritual religious healing methods?<end> . . . . <so-called = RIDICULE> The so-called "gates" in the spinal cord as propounded by Melzack and Wall . . . Wall . . whom the proponents of acupuncture quote to bolster their claims . . . <end> . . . . <AUTHOR'S PURPOSE> This article is not intended as a criticism of acupuncture analgesia. . . . The purpose is solely to respectfully clarify its modus operandi, reconcile the mutually contradictory theories and the variegated formulations to explain its scientific rationale.<end> . . . <FAILURE OF MODERN MEDICINE> Many physicians are being bombarded with calls from frantic people looking for a "miracle cure". <QUACKERY> False hopes are now being generated. Practitioners of acupuncture, many of whom are not physicians will try and take advantage of the vague laws and guidelines. The first to be disillusioned will be the arthritics, then the asthmatics, the neurotics and the cancerous. Help will seem imminent to these--they will journey to the Lourdes of acupuncture and throw down their crutches and their canes, not realizing that it's not the rock that cures, but their own inner belief. . . . Some will die. Others will complain. Mankind itself will suffer ultimately. The cycle is plain to see. Calm is called for, rationality is called for; sensibility if called for.<end> <COSMOLOGY> If we assimilate acupuncture as it has been given to us--with the charts, mannikins, meridians, <MERIDIAN SYSTEM> needles, electric currents and the Chinese cosmology along with it--<DEFENDING ONE'S TURF> will we not be nurturing the same kind of tragedy that happened to the acceptance of hypnosis many years ago as promulgated by Mesmer? We must not be neophytes influenced by pseudo-scientific metaphysical pseudoentities. If this is continued, we in American medicine are liable to become relegated to the status of faith healers. <=QUACKERY> We must be careful not to embrace something very old which appears to us in a new guise, by another name.<end>

16. Toyama, Philip M., M.D.; Nishizawa, Michimasa (Department of Pathology, Bowman Gray School of Medicine, Wake Forest University, Winston-Salem, NC and Toyo Shinkyu Senmon Gakko, Tokyo, Japan). The traditional oriental medicine and acupuncture therapy. [Journal Article. Review.] Journal of the Mississippi State Medical Association. November 1973; 14(11): 488-495; ISSN: 0026-6396.
Note: Non-Refereed Serial; Mississippi State Medical Association.
Philosophy, Medical.
UI 74025630.

<DEFINITION OF ACUPUNCTURE>
<TEXTBOOKS> During the past 30 years, a number of textbooks on acupuncture have been translated into major European languages. . <end> . . . <CURRICULUM> In France, acupuncture is now being taught within the curriculum of the teaching hospitals.<end> . . . <IMPACT OF SPECIFIC REPORTS> In America, recent reports by Veith . . and Dimond . . have generated widespread <PUBLIC INTEREST> interest among physicians.<end> . . . . <INTEGRATION OF RIVAL ASSUMPTIONS> In the traditional Oriental medicine, the skin and internal organs are considered to be very closely interrelated. . . . It is important to indicate that the acupuncture points correspond very well with Head's areas of referred pains.<end> . . . <MECHANISMS> It is, . . ., quite possible that such a normalizing effect of acupuncture on the function of the autonomous nervous system may be mediated at the level of the thalamus rather than in the spinal cord. In any event, it is clear from the Grashchenkov's data that acupuncture does exert its action

on the autonomic nervous system for the normalization of its function. . . . Through the studies of neurodermatitis and other chronic dermatoses, ancient Chinese physicians were aware of the close relationship between the two . . . According to their <=Rasmussen and Penfield> investigation of the cerebral cortex of man, each area of the skin surface of the body and extremities has a representative area in the cerebral cortex.<end> . . . . <POSTULATE> The beneficial effect of acupuncture for the treatment of chronic inflammatory diseases is therefore probably due to its effect on normalizing internal environmental factors through the adjustment of the autonomic nervous system and the endocrine system as well.<end> . . . <RATIONALE; CONDITIONS> Some attempts were made in the preceding pages to explain the mechanism of action of acupuncture, but the real significance cannot be displayed sufficiently unless the fundamental principles of Oriental medicine are understood, and subsequently its unique diagnostics and therapeutics are learned.<end> . . . . <PATIENT RESPONSIBILITY> Many patients when attacked by disease, do not take the trouble to search for the cause of their illness.<end> . . . <CONTRASTS> Western medicine has hitherto dealt mainly with the material structure and the molecular property of the organism. In the Orient, however, many scholars have studied the immaterial world and kinetic structures of each phenomenon for several thousand years. Objects are viewed in terms of energetics and function from the standpoint of unity, synthesis, and totality. The pathology is studied from a synthetic point of view.<end>

<EDITORS DISCLAIMER> The editors neither endorse this paper nor condemn it. Because of the wide publicity given acupuncture at the moment, it was considered to be of <PUBLIC INTEREST> general interest.<end>

17. Lewin, Andrew J., M.D. (Cedars-Sinai Medical Center, Los Angeles and the Department of Medicine, University of California, Los Angeles, Center for the Health Sciences.) Acupuncture and its role in modern medicine [Historical Article. Journal Article.] The Western Journal of Medicine. January 1974; 120(1): 27-32; ISSN: 0093-0415.
Note: Refereed Serial; California Medical Association.
UI 74093845.

<DEFINITION + HISTORICAL FOUNDATION> Acupuncture is one of the world's oldest healing arts. It encompasses an empiric body of knowledge accumulated over the past five thousand years.<end> <MEDICAL LITERATURE> So little scientific information has appeared in the literature that an accurate appraisal of the therapeutic value of acupuncture is difficult.<end> . . . . <TRAVELER'S ACCOUNTS> Although the practice of acupuncture has recently received a great deal of publicity in the United States, largely due to reports by Americans who visited mainland China, . . . <end> . . . . <SCIENTIFIC DOCUMENTATION> It is impossible, however, to assess the validity of these accounts, since the type of scientific documentation that forms the basis for Western medical knowledge is almost totally lacking in these completely uncontrolled and often anecdotal reports.<end> . . . <NEED FOR CLINICAL TRIALS> With our present degree of knowledge of acupuncture, these reports cannot be totally dismissed. But, to be taken seriously by Western physicians, <SET CRITERIA FOR ACCEPTANCE> more careful studies are necessary.<end> . . . <ANOMALY> It is this use <ANESTHETIC AGENT> of acupuncture more than any other which has stimulated the <PUBLIC INTEREST> interest of Western observers . . <end> . . . . <BIAS> But there is also careful preoperative selection and training of the patients, which is not well detailed in the reports and certainly biases the statistics.<end> . . . <ABDOMINAL SURGERY> . . . found to be less useful in abdominal procedures where satisfactory muscle relaxation is difficult to achieve and traction on the viscera often produces some discomfort.<end> . . . . <REASON FOR ACCEPTANCE; SIDE EFFECTS OF WESTERN CHEMICAL ANESTHESIA> Since a large proportion of surgical morbidity and mortality is due to complications of anesthesia rather than to the procedures themselves, any technique which could decrease these untoward effects would have a significant impact on the outcome of many operations.<end> . . . <DISMISSAL OF PARADIGM> There are numerous theories concerning the way in which acupuncture produces

its effects. Many of these are based on ancient religious and philosophic beliefs and will not be further discussed here.<end> <CLASHING COSMOLOGIES> It must be remembered, however, that in the eyes of many practitioners these religious and philosophic explanations are more "logical" and "rational" than the modern scientific theories that Western medical science proposes, for data accepted as "proof" in different cultures are very much related to their fundamental concepts of nature and life.<end> . . . . <SCIENTIFIC VALIDITY> Although, it is very difficult to determine the scientific validity of these experiments, <= those done in Asian countries and USSR> some of the reported findings are of <PUBLIC INTEREST> interest.<end> . . . <MEDICAL LITERATURE> It must be restated that the specific techniques and actual data from which these conclusions are drawn <Korean biologist, Kim Bong Han's study> are unavailable in the literature.<end>
<SUMMARIES OF LITERATURE REVIEWS>
<RIVAL GUIDING ASSUMPTIONS; REPLACEMENT> Probably the most important of all problems involving acupuncture, is its use in place of Western medical therapy.<end> . . . <ADVOCATES SIMULTANEOUS USE = H11> Western medicine has developed many diagnostic and therapeutic techniques which have proved efficacious after many years of study and experience. Where it is employed, acupuncture should be used as an adjunctive form of therapy to standard medical treatment, not as a replacement for conventional cures.<end>
<FULL CITATION TO JAMES RESTON'S ARTICLES IN THE N.Y. TIMES>

18. Anonymous. Does acupuncture work? [Letter to the Editor]. CMAJ: Canadian Medical Association Journal. February 2, 1974; 110(3): 257.
Note: Refereed Serial; Canadian Medical Association.
Coded by Medline as a "Journal Article.
UI 74093060.

<INCREASE IN PUBLICATION> Within the last two years we have been subjected to a flood of laudatory descriptions of the achievements of acupuncture, with particular reference to the most recent development, the use of electro-acupuncture for operative anesthesia.<end> . . . <SOCIETY JOURNALS> In Britain the correspondents of both the *British Medical Journal* and *The Lancet* have been busy discussing the question.<end> <SKEPTICISM> Sir Robert Macintosh, the distinguished anesthesiologist, believes that acupuncture is just an effective way of using hypnosis . . In his experience, it works only in a limited range of surgery and on a very limited number of patients. The idea that it can be put alongside general and local anesthesia is nonsense <=RIDICULE> and that there are specific acupuncture points is also absurd. <TRAVELER'S ACCOUNT> On his study tour of China, Sir Robert saw nothing more remarkable than was described in the 1846 work by the British hypnotist Esdaile.<end> . . . <CONFIRMATION OF OPINION> Nor are the Germans any more enthusiastic about results.<end>

19. Smith, A. J. (Assistant Editor of the British Medical Journal). Medicine in China: Best of the old and new [Journal Article.] British Medical Journal. May 18, 1974; 2(915): 367-370; ISSN: 0007-1447.
Note: Non-Refereed Serial.
Philosophy, Medical.
UI 74251068.

<TRAVELER'S ACCOUNT> Perhaps the biggest surprise for the medical visitor to China is . . . .<end> . . . <CLASH> . . . the intellectual elitism of practitioners of Western medicine had prevented the union that should have taken place between the traditional and Western systems.<end>
<PHOTOGRAPHS OF CHINA>
<HISTORICAL BACKGROUND; SUMMARIES OF TEXTS>
<RIVAL PARADIGMS> There is no possible reconciliation between the theories of function and disease underlying the two systems--but acting on the principle enunciated by Mao Tsetung that

"the past must serve the present" forms of treatment that have proved effective in practice have been adopted by both types of practitioner without any implied acceptance of the theoretical background.<end> . . . . <PHARMACOLOGICAL RESEARCH> Efforts have also been made in research institutes to establish the content of these remedies and to assess their therapeutic value. The Institute of Materia Medica of the Chinese Academy of Medical Sciences is reputed to be making its way through the "treasure house" of traditional medicine, isolating and identifying the active principles.<end> <CLINICAL TRIALS> Clinical trials are under way in many centres.<end> . . . . <UNDERLYING ASSUMPTIONS; ETHICS> However, Chinese physicians we met seemed unanimous in their opinion that the use of placebos was unethical--it conflicted with the primary purpose of medicine.<end> . . . . <ANOMALY> Moxibustion seems to be unique to Chinese traditional medicine.<end> . . . . Current <PUBLIC INTEREST> interest in the West is concentrated on its <=acupuncture> use in anaesthesia.<end>
<DEFINITIONS; BACKGROUND INFORMATION>
<PUBLIC INTEREST> For many people inside and outside medicine the use of acupuncture for anaesthesia is the major point of interest in modern medicine in China.<end> . . . . <INITIAL SUCCESS> The success of the procedure has clearly given an enormous impetus to the reassessment by scientific methods of the range corpus of practices used in traditional medicine; and this process, which has only just begun, may be expected to provide medical scientists in China and the West with more surprises in the future.<end>

20. Pfeiffer, Alfred. Akupunktur und wissenschaftliche Medizin [Journal Article.] Psychiatrie Neurologie Medizin Pscyhologie (Leipiz). June 1974; 26(6): 369-373; ISSN: 0033-2739.
    Note: Non-Refereed Serial; German.
    Models, Neurological.
    UI 74291186.

    <NEEDS TO BE TRANSLATED> Cursory translation indicates the article is a description of the theories in Chinese traditional medicine.

21. James, T. History of Medicine: Acupuncturation: A Western perspective [Historical Article. Journal Article]. South African Medical Journal. July 13, 1974; 48(33): 1435-1440; ISSN: 0038-2469.
    Note: Non-Refereed Serial.
    Philosophy, Medical.
    UI 75034939.

    <PROPAGANDA> Whether the <PUBLIC INTEREST> modern interest in the practice of the procedure of acupuncture is the result of Chairman Mao's propaganda for the renaissance of traditional Chinese medicine and, therefore, a manifestation of 20th-century progress of mainland China, or the result of a leakage into Western life via Japan, where it has for many centuries been commonly used (with herbal liquids and `moxibustion' in `orthodox' medicine, is uncertain.<end> <MARCO POLO> That it is of ancient Chinese origin there is no doubt, yet Marco Polo, who does not mention physicians in his acquaintance in that part of the world, with his often irritating brevity of description, does not even hint <EARLY OPPORTUNITY FOR TRANSMISSION MISSED> at so extraordinary a method of treatment.<end> . . . . <The factual observances to justify the validity of the procedure are so many, and yet so full of speculation regarding the *modus operandi*, that its comparative simplicity of application has become cluttered with much fiction. . . . .Nevertheless, whatever the true *modus operandi* might be, in certain kinds of cases it "works", and this fact has led to the practice being `received' in Western Europe and North America today. It has never ceased to be practised in China and Japan, although in these lands political, polemical, and other hazardous circumstances introduced lulls in the application of the technique; but in the West it has revived, like the Phoenix, from the ashes of its demise after about a century of neglect.<end> . . . . <ORIENTALISM> This enthusiasm may well serve to destroy or obscure what intrinsic value acupuncture may have, in that, after some years of

misused and even abused practice, it could again disappear from Western medicine.<end>
<CITES WILHELMI TEN RYNE 1683 ACCOUNT>
<VOGUE; 1811>
<1811> There is little doubt from reading commentaries on the observations of those times, that the practitioners of acupuncture did not allow their critical faculties to be deceived by the wide-eyed wonder with which the results of acupuncture were witnessed. On the contrary, questioning was the order to the day and the impressive successes obtained by Elliotson . . probably lost much impact by his efforts to find a satisfactory theory or even hypothesis for the success of the treatment, only to tumble into the ditch of `animal magnetism' from which he did not extricate himself.<end>
<TRANSCRIPTION FROM FIRST VOLUME OF *THE LANCET*, 1823>
<INFORMATION OVERLOAD; SARCASM; DISSATISFACTION WITH CURRENT SCIENTIFIC COMMUNICATION> In those leisurely days when paper was cheap, doctors literate, and writing a pleasure, the editors of medical journals rarely, if ever, abbreviated an author's text.<end> <19th CENTURY PARADIGM> Acupuncture with its oriental and newly-found European repute fitted very well into Western practice. Dr. T. W. Wansbrough, . . of Fulham, described a case of rheumatism successfully treated by `acupuncturation'. It exemplified, as he put it, `in a most remarkable degree of efficacy of acupuncturation, a remedy which in despite of the sneers of certain learned sages, has come into general use. . <1826><end> . . . . <Professor Elliotson said in one of his lectures: `It is a remedy not sufficiently attended to by practitioners at large, for some think that patients will not submit to it; others that it is tiresome; and some think that it is whimsical, and therefore not ever likely to become a popular remedy'. . <end> . . . <MEDICAL LITERATURE> By the end of 1832 to all appearances, *The Lancet* regarded treatment by acupuncture to have established itself in England, for no mention of the procedure appears again in *The Lancet* until 1871, when *The Medical Times and Gazette* also published a notice. But the *British Medical Journal* reintroduced this method of treatment in 1885 when it published some of the proceedings of the Section of Medicine at the Annual Meeting of the British Medical Association <MEDICAL SOCIETY> at Cardiff, in Wales. Dr. Lorimer, . . who addressed the meeting on this subject, could not easily explain why it had fallen into neglect and `passed into disregard and disuse'. He thought it may have been superseded by other and better means such as hypodermic methods of treatment; or that it had suffered at the hands of charlatans; or, as had been suggested to him `that there is some disinclination to use a remedial agent whose *modus operandi* cannot, in some way, be connected analogically or otherwise, with that of the remedies which common use or universal experience has sanctioned. He regretted, however, that acupuncture has passed out of fashion and he hoped to show it had done so undeservedly. He entered into some detail about cases successfully treated, the criteria to be observed, and discussed in a scientific manner the theory of its working: there was never a mention of the Chinese Yin and Yang.<end>. . . . <DISAPPEARANCE> Acupuncture, nevertheless, did die away in England, although in France the *acupuncteurs* or *acuponcteurs* continued to practice in odd corners of Paris. After its practical disappearance from British medicine for 70 years or more, there came a resurgence of <PUBLIC INTEREST> interest in the procedure which I have not yet found adequately explained. News came form China in 1972 that acupuncture was being used for inducing anaesthesia for major surgical operations--. . . . <SKEPTICISM> Speculation about its *modus operandi*, most of which appears to centre about hypnotic influence, are promulgated by sceptics who find it extremely difficult to put aside their scientific knowledge relating to anatomy and physiology in order to accept the surprising sites chosen for needling, and `their incongruity and the lack of any rational explanation for the effects produced'. The scientific explanations mooted 150 years ago, when <PUBLIC INTEREST> interest in acupuncturation was just as intense, were well thought out by the theorists who tried to formulate a hypothesis to fit the needles. . . . animal experimentations . . . . This trial of acupuncture had only just been preceded by a comment in the *British Medical Journal* to the effect that `scoffing is giving place to astonished incredulity at some of the demonstrations of acupuncture analgesia.<end> <ANOMALY; MOTIVATION> On February 1 of this year the mystery of acupuncture had so deepened that the Section of the Anaesthetics of the Royal Society

of Medicine combined with the Section of the History of Medicine to endeavour to find some solution to the problem of anaesthesia by acupuncture.<end>

22. Hebert, Raymond E. (Executive Secretary, National Acupuncture Research Society). In defense of acupuncture [Letter to the Editor]. American Dental Association Journal. September 1974; 89(3): 534-535; ISSN: 0002-8177.
    Note: Refereed Serial; American Dental Association.
    Coded by Medline as a "Journal Article".
    UI 75011866.

    <ACRIMONIOUS DEBATE; RIDICULE; PERSONAL ATTACKS AGAINST ONE'S REPUTATION> In reply to the reckless assertions of Bruce L. Douglas . . . He is a man who not more than a year ago publicly asserted that acupuncture was humbug . . . It would appear to us that, at this stage, the distribution of his remarks does not truly reflect so much but rather attempts to once more damage the reputation of acupuncture and the societies that support it. What bothers us more than anything is the way Dr. Douglas, having attempted no contact with our society and having no information on our course content on training in acupuncture that we are aware of, now singles our for attack our organization and our highly acclaimed dental acupuncture workshops . . . But for him to mount this unprovoked criticism seems to be a result of personal motivation rather than an attempt to alert his fellow colleagues.<end> <DATE> We would like to point out that the National Acupuncture Research Society, founded in 1971 by university dental and medical professors . . . . We limit membership . . . <end> . . . . <PERSONALITY> Is Dr. Douglas so afraid that this information might insubstantiate his pet theory about acupuncture being humbug?<end>

23. Draper, C. L. W., M.D., Ch.B. What is a quack? [Letter to the Editor]. CMAJ: Canadian Medical Association Journal. September 7, 1974; 111(5): 393; ISSN: 0008-4409.
    Note: Refereed Serial; Canadian Medical Association.
    Coded by Medline as a "Journal Article".
    UI 75012249.

    <SUCCESS; MECHANISM NOT UNDERSTOOD> We do not know why it works or how it works but most of us are convinced that it does work. Many of us have witnessed demonstrations <EYE WITNESS ACCOUNTS> of it and some of us use it – even <SARCASM IN REFERRING TO THE FOUNDER OF MODERN MEDICINE>(hats off) Osler (hats on again, lads).<end> <QUACKERY> Those who use acupuncture are not considered quacks even if they have no medical qualifications. This strikes me as very peculiar indeed.<end> <FAILURE OF MODERN MEDICINE> You see, I have patients who have been treated successfully by chiropractors when I have failed. Even more have been treated successfully by megavitamins or manipulations, but physicians <LICENSE ISSUE; FORCED CONFORMITY> using these methods are considered quacks despite the fact they may have medical degrees and specialist qualifications <MEMBERSHIP QUALIFICATIONS> in their fields. Now this strikes me as odd.<end>

24. Bresler, David E.; Cohen, Jay S.; Kroening, Richard; Levin, Norman; Sadoff, Armin (School of Medicine, University of California, Los Angeles). The potential of acupuncture for the behavioral sciences [Journal Article]. American Psychologist. March 1975; 30(3): 411-414; ISSN: 0003-066X.
    Note: Refereed Serial; American Psychological Association.
    UI 75181871.

    <DEFINITIONS> Acupuncture is one of the oldest systems of medicine known to contemporary man.<end> . . . <CURRICULUM> Many American medical schools are now initiating research studies designed to explore the usefulness of acupuncture in treating other disorders . . .<end>

<HISTORICAL BACKGROUND; ETHNOGRAPHIC PARALLELS>
<RIVAL ASSUMPTIONS> Many contemporary acupuncturists prefer explanations based on current neurophysiological explanations such as the "gate-control" theory. Others maintain that acupuncture is nothing more than an effective use of hypnosis. <LACK OF EXPLANATORY POWER> Unfortunately, none of these theories advanced to data adequately explains all that is known about acupuncture. <CONTROVERSY = DEBATE> Indeed, the debate and controversy among the acupuncturists concerning this issue is as strong or even stronger than that among Western physicians <COMMUNITIES OF SCIENTISTS>. Hopefully, future research will shed light on this ancient mystery.<end> . . . <ANOMALIES> . . . spontaneous remission . . . As a result, there has been major skepticism in the Western medical community concerning whether acupuncture is any more effective than placebo therapy.<end> <FAILURE OF MODERN MEDICINE; CHRONIC PAIN> The most actively investigated application of acupuncture in the West has been for the treatment of chronic pain disorders that are refractory to other forms of therapy.<end> . . . <LIMITATIONS> Although initial reports from China suggested that acupuncture analgesia could be widely applied as a surgical analgesic, recent reports suggest that these claims may have been overly optimistic.<end> . . . <TRAVELER'S ACCOUNT> In a report from a Norwegian medical study group that visited the People's Republic of China in October 1973 . . . <end> . . . . <RIVAL ASSUMPTIONS> It is, however, difficult to interpret the Chinese reports in light of contemporary Western research because of differences in diagnostic and scientific methodology in addition to the major cultural, social, and political differences between China and the West.<end> . . . <TESTS> Their <=Wen and Cheng> techniques have been replicated and expanded by several American physicians . . . <end> . . . <FOUNDATION> We must recognize that all psychophysiological disorders spontaneously fluctuate in severity, and that a host of extraneous factors may influence the course that these conditions follow. Carefully controlled scientific evaluation of these preliminary findings must be made before any firm conclusions can be drawn concerning the therapeutic efficacy of acupuncture in this area.<end> . . . . <LEGAL STATUS> At present the legal status of acupuncture varies greatly from state to state. . . . The only federal regulations that currently exist concern Food and Drug Administration policy with respect to importation of acupuncture needles.<end>

25. Bourne, Peter G., M.D. (Drug Abuse Council, Washington, D.C.) Non-pharmacological approaches to the treatment of drug abuse. [Journal Article]. American Journal of Chinese Medicine. July 1975; 3(3): 235-244; ISSN: 0090-2942.
Note: Non-Refereed Serial.
Philosophy.
UI 76059093.

<DISSATISFACTION WITH BIOMEDICINE> . . . disenchantment with methadone maintenance . . . <end> . . . .
<NO DEFINITIONS OR TRAVELER'S ACCOUNTS>
<REASON FOR STUDY> The use of acupuncture in the treatment of addiction is a relatively new event and represents the application of a very old treatment technique to a new condition. The recent use of acupuncture in the treatment of addiction dates from the work of Dr. H.L. Wen in Hong Kong in 1972. . <end> . . . . <DISSEMINATION> Awareness of Dr. Wen's work with heroin addicts occurred in the United States at about the same time that the general <PUBLIC INTEREST> awakening of interest in acupuncture as a medical procedure took place.<end> . . . <CURIOSITY> . . . there was considerably more intellectual enthusiasm than actual practice . . . . largely to satisfy their own curiosity . . . they have no <KEY TEST> hard data on follow-up with their patients.<end> . . . . <PUBLIC INTEREST> Acupuncture has been regarded by the general public in the last few years both with unbridled enthusiasm and considerable skepticism.<end> . . . <RIVAL ASSUMPTIONS> Part of the problem encountered by those advocating the use of acupuncture is that to those educated in the Western medical tradition, there seems to be no immediately apparent physiological explanation of why it works, if it does. Many workers in the

drug field <MARKET FORCES> are willing to accept that, empirically, acupuncture may have some effect, <USE BUT CAN'T EXPLAIN = H13> but they are <OPPOSING VIEWS; RISK OF ENDANGERING PROFESSIONAL REPUTATION> unwilling to accept or get involved in the traditional Oriental explanations of how acupuncture works and particularly the philosophical concepts that have surrounded it in the past.<end>

26. Madell, Jane R., Ph.D. (Department of Audiology, New York League for the Hard of Hearing). Acupuncture for sensorineural hearing loss [Clinical Trial. Journal Article]. Archives of Otolaryngology. July 1975; 101(7): 441-415; ISSN: 0003-9977.
Note: Refereed Serial; American Medical Association.
UI 75204582.

<DISSEMINATION> Acupuncture clinics have opened in many cities and have received substantial amounts of publicity in the media.<end> <PATIENT BEHAVIOR> Parents of hearing-impaired children, as well has hearing-impaired adults, are visiting them <=clinics> with the hope of improving hearing.<MEDIA> Concern has been heightened by reports appearing in the media based on the acupuncture treatment of hearing loss with substandard controls, insufficient numbers of subjects, or curtailed duration of treatment and follow-up.<end> <PURPOSE OF STUDY> For these reasons it seemed necessary to do a properly controlled study <CRITERIA FOR ACCEPTANCE> to determine if acupuncture could be effective in improving the hearing of children with sensorineural hearing loss. Since the inception of this study, a number of articles have appeared in the literature <LITERATURE>, all demonstrating essentially negative results. . . . . No reports could be found from the literature concerning the consistency of week-to-week test results for children . . . . <end>

27. Gaw, Albert C., M.D.; Chang, Lennig W., M.D.; Shaw, Lein-Chun, M.D. (Department of Psychiatry, Community Health, Medicine (Rheumatology Unit), and Pediatrics, New England Medical Center Hospital). Efficacy of acupuncture on osteoarthritis pain: A controlled double-blind study. [Clinical Trial. Journal Article]. New England Journal of Medicine. August 21, 1975; 293(8): 375-378; ISSN: 0028-4793.
Note: Refereed Serial; Massachusetts Medical Society.
UI 75216374.

<TRAVELER'S REPORTS> Recent reports by American physician visitors to the People's Republic of China on the use of acupuncture as a means of inducing surgical analgesia have suggested the need for controlled studies <DETERMINING TEST> to investigate the possible use of acupuncture as a palliative procedure for the symptomatic relief of chronic pain. . . . . This study used a prospective, randomized, double-blind design.<end> . . . . <PUBLIC INTEREST> Current widespread interest in acupuncture notwithstanding, results from <KEY TEST> controlled studies to determine its alleged <=SKEPTICISM> effectiveness in relieving chronic pain are few.<end> . . . . <EXPLANATION> Another explanation may include . . . possible suggestive factor engendered by <PUBLIC INTEREST> widespread publicity in the media about the alleged <=SKEPTICISM> effectiveness of acupuncture in relieving pain.<end> . . . . <NEED FOR FURTHER TESTS> The data simply point to the need for additional control studies, a task that we believe can help clarify the many unanswered questions about this ancient, empirical treatment procedure and, in the long run, may <RESEARCH GOAL> advance understanding of the pain phenomenon.<end>

28. Pfifferling, John-Henry (Department of Family Medicine, University of Mississippi Medical Center, Jackson, MS). Some issues in the consideration of non-Western and Western folk practices as epidemiological data [Journal Article]. Social Science and Medicine. November-December 1975; 9(11-12): 655-658; ISSN: 0037-7856.
Note: Refereed Serial.
Models, Biological.

UI 76178140.

<CRISIS IN BIOMEDICAL MODEL> It is becoming increasingly obvious to physicians that the causal factor(s) in disease are to be found in physical *and* social domains. A reliance on the concept of the single etiologic agent as *the* causative pathogen is no longer tenable for the manifestations and the behavior of the diseased host. However, the behavior of the physician in treating disease is still primarily <MECHANISTIC> mechanistically oriented. . <end> . . . . <CALL FOR CHANGE> It is time that techniques from epidemiology are incorporated in anthropological research.<end> . . . <RIVAL SETS> By noting the way the folk classify and respond to locally acceptable treatment regimens and by determining their prevalence (both the entity and its cure) we should be able to pave the way for inclusion of some elements of the non-western armamentarium into the Western delivery of health care services.<end> . . . <UNDERLYING ASSUMPTIONS> In the analysis of folk epidemiologic rates specific possible independent variables may consist of the following items: life cycle events, migration, fertility, infertility, climacteric, entrance into school, etc.<end> . . . . <CALL FOR CHANGE> Our plea is that the anthropologist and the clinician be aware of folk defined episodes of folk defined illnesses.<end> <INTEGRATION> By borrowing the disease transmission model and applying it to the folk world we may identify one method for achieving folk epidemiology. . . . . This postulated mechanism of protection, when clearly isolated, will surely be a mode of adaptation.<end> . . . . <CURRICULUM> Medial teaching could, perhaps should, search for the psychosocial protective devices <NO REFERENCE TO ENGEL> . . . <FAILURE> So much data that is relevant to the understanding of the illness is lost by basing out search for causation on retrospective data collection.<end> . . . . <CONSENSUS> From a native viewpoint, . . . , what degree of consensus, within the cultural group, should serve as a baseline for accepting native putative agents?<end> . . . . <FAILURE> The professional medical care evaluation literature, for the last decade, has wrestled unsuccessfully with the definition of an outcome measure. The language of illness description is fraught with linguistic ambiguity. . . These concepts appear clear to very few health professionals and less to consumers. They are used with a cavalier clarity but on closer inspection are enormously vague. To the Western medical laity, notions such as discharge or medical outcome are reified <=PHYSICIAN AS GOD/PRIEST> far beyond what is generally understood by practitioners. . . . There is currently no acceptable criterion for outcome in our medical culture so why should we expect this for other cultures or sub-cultures. . . Where there is a schism between the community's perception of illness and the clinician's perception one can expect a difficult reincorporation for the patient. . . . We ask, do they *have* to be compared and is our Western classification system any less arbitrary or nomothetic than any local system. . . . <FADISM> When one compares terminology used in different decades of the 20th century, a remarkable amount of faddism is noted. . . . The Western physician, by adopting an epidemiologic perspective, including an awareness of cultural factors may be able to approach patients with multiple problems in a less constrained way. . . By perceiving all illness form a biosocial orientation, the multicausal framework is seen as a needed theoretical model <end>
<NEITHER ENGEL NOR HIS BIOPSYCHOSOCIAL MODEL IS CITED>

29. Moore, Mary E., M.D., Ph.D., F.A.C.P.; Berk, Stephen N., Ph.D. (Department of Medicine and Psychology, and the Pain Control Center, Temple University, Philadelphia, PA). Acupuncture for chronic shoulder pain: An experimental study with attention to the role of placebo and hypnotic susceptibility [Clinical Trial. Journal Article]. Annals of Internal Medicine. April 1976; 84(4): 381-384; ISSN: 0003-4819.
Note: Refereed Serial; American College of Physicians; Presented in part at the 39th Annual Meeting of the American Rheumatism Association, New Orleans, LA, June 1975.
UI 76159076.

<TIME; PUBLIC INTEREST; KEY TEST> Despite the four years that have passed since acupuncture was enthusiastically reintroduced into the United States, the literature still consists

largely of uncontrolled observations and contains few experimental studies of acupuncture.<end> . . . . <MASS MEDIA'S IMPACT> Perhaps our attempts at establishing the settling by varying the introductory statement and the type of communication by the acupuncture were too feeble, as compared with the amount of enthusiastic comments concerning acupuncture to which the subjects were continually exposed in the mass media and in <PERSONAL COMMUNICATION> informal interchange with family and friends.<end> . . . <SKEPTICISM> . . . we are challenging those who believe . . . Until this evidence is forthcoming, we will remain skeptics concerning the role of acupuncture in modern science.<end>

30. Mok, Martin S., M.D. (Harbor General Hospital, University of California, Los Angeles, School of Medicine, Assistant Professor, Department of Anesthesiology, U.C.L.A. School of Medicine); Parker, Lawrence N., M.D. (Research Fellow in Endocrinology and Metabolism, U.C.L.A. School of Medicine); Voina, Sandra, M.S. (Research Technologist in Endocrinology and Metabolism, U.C.L.A. School of Medicine); Bray, George A., M.D. (Professor, Department of Medicine, Division of Endocrinology and Metabolism, U.C.L.A. School of Medicine). Treatment of obesity by acupuncture [Journal Article]. American Journal of Clinical Nutrition. August 1976; 29(8): 832-835; ISSN: 0002-9165.
    Note: Refereed Serial; American Society for Clinical Nutrition.
    UI 76250153.

    <POPULARITY> Although the use of acupuncture in the treatment of obesity is relatively new, it has spread rapidly in the United States. However, <KEY TESTS> there have been no controlled and statistically-analyzed studies of the efficacy of this procedure, and therefore, the present study was undertaken.<end> . . . . <LACK OF CONFORMITY> However, no tables or statistical analysis of data were presented in Giller's report.<end>

31. Sadowsky, Donald, DDS, MPH. The scientific method and acupuncture research [Historical Article. Journal Article]. American Dental Association Journal. August 1976; 93(2): 355-356; ISSN: 0002-8177.
    Note: Refereed Serial; American Dental Association.
    UI 76238138.

    <OFFICIAL STATEMENT> In May 1973, THE JOURNAL <=A.D.A.J.> carried a Council on Dental Research position statement on the dental application of acupuncture . . . "the Council was impressed by the overall lack of scientifically valid information about the subject." The Council was deeply concerned about "the premature and opportunistic use of acupuncture by dentists regardless of whether it was used for the therapeutic relief of orofacial pain or as a means of achieving anesthesia for operative and surgical procedures".<end>
    <OUTLINES KUHN'S WORK ON SCIENTIFIC REVOLUTIONS>
    <SKEPTICISM; CRITERIA? The Chinese theory of acupuncture analgesia, which involves energy passing along meridians <MERIDIAN SYSTEM> of the body (as yet undemonstrated) does not meet Occam's <=William of Occam, 14th British philosopher's concept that "the most probably explanations of phenomena are also the simplest and most direct"> criteria. On the basis of our knowledge about anatomy, this theory is unnecessarily speculative and must be treated with respectful skepticism.<end>

32. Chapman, C. Richard, Ph.D. (C.R.C., Departments of Anesthesiology, Psychiatry and Behavioral Sciences, Psychology and Anesthesia Research Center, RN-10, University of Washington, Seattle, WA); Wilson, Michael E., (M.E.W., Department of Anesthesiology and Anesthesia Research Center); Gehrig, John D., (J.D.G., Department of Oral and Maxillofacial Surgery, University of Washington, Schools of Medicine and Dentistry, and College of Arts and Sciences, Seattle, WA). Comparative effects of acupuncture and transcutaneous stimulation on the perception of painful dental stimuli [Clinical Trial. Journal Article]. Pain. September 1976; 2(3): 265-283; ISSN: 0304-3959.
    Note: Refereed Serial.

UI 77193018.

<NO DEFINITIONS OR HISTORY OF ACUPUNCTURE>
<MEDIA ATTENTION> Reports of "acupuncture anesthesia" continue to draw attention in the Western world, even though acupuncture seems destined to have little direct effect on Western anesthetic practice. . Interest has been maintained, in part, because acupuncture has introduced many new and provocative questions about the nature of the human pain experience and mechanisms generating analgesic states.<end> . . . . <LACK OF UNDERSTANDING> . . . they <=Chaves and Barber> have charged that the painfulness of surgery has been greatly overestimated by Western physicians.<end> . . . . <RIVAL SETS OF ASSUMPTIONS> Interestingly, these two camps <=Gate Control Theory vs. psychological factors> mirror the classical philosophical dichotomy of mind and body that has structured much of Western thought about pain and illness.<end> . . . . <LACK OF POSTULATES> Pain is a difficult term to define, and consequently analgesia, the absence of pain, is a problematic concept.<end> . . . . <RAISES NEW QUESTIONS> The present study has demonstrated that acupunctural analgesia is a phenomenon which can provide a new window on the mystery of the human pain experience. As such it provides a rich source for new, provocative, information about pain. Hopefully, the disenchantment of clinicians with the potentials of acupuncture analgesia for Western anesthesia practice will not dissuade basic scientists from using acupunctural phenomena for fact gathering and hypothesis testing.<end>

33. Ghia, Jawahar N. (Department of Anesthesiology, University of North Carolina Memorial Hospital, J.N.G., and W.M.); Mao, Willie, (Department of Psychiatry T.C.T.); Toomey, Timothy C. (Department of Oral Surgery, School of Dentistry J.M.G., University of North Carolina at Chapel Hill, NC); Gregg, John M., (Department of Oral Surgery, School of Dentistry J.M.G., University of North Carolina at Chapel Hill, NC). Acupuncture and chronic pain mechanisms [Clinical Trial. Journal Article]. Pain. September 1976; 2(3): 285-299; ISSN: 0304-3959.
Note: Refereed Serial.
UI 77193019.

<INCREASING USE> Acupuncture is increasingly employed as a treatment modality for chronic pain states. <KEY TESTS> In spite of a number of reports of success in managing chronic pain, little investigative effort has been directed at controlled comparisons with other treatment modalities or at somatic or psychologic factors which might modify or predict treatment effectiveness. In view of the increasing use of this procedure, the need for studies delineating factors associated with its success and failure is becoming apparent. . . . In recent years much emphasis has been placed on the accurate selection of acupuncture points as a possible mechanism for its effectiveness. . . . One of the more fascinating aspects of acupuncture analgesia is the degree of variation in the distribution of acupuncture sites for the insertion of needles for the same operative procedure in the hands of different acupuncturists.<end> . . . .
<POSTULATES> This would suggest that if acupuncture is performed on any region where the nerve endings are richly scattered, it can produce sufficient impulses to inhibit the central nervous system fibers which process pain sensations and thus elevate the pain threshold. Interestingly, it has been claimed that the resistance to electrical current flow is different at acupuncture sites than at other skin areas. <NOTE THIS WAS FILMED ON "IN SEARCH OF"> . . . . A high degree of correspondence between the various trigger areas and classical acupuncture points was noted in this study and this observation tends to support the above speculations regarding the specificity of the points. . . . gate control model of pain, offer better explanatory power . . . <end>
<TECHNICAL PHYSIOLOGICAL FINDINGS>

34. Jellife, Derrick B.; Jellife, E. F. Patrice (Division of Population, Family and International Health, School of Public Health, University of California, Los Angeles, CA). The cultural cul-de-sac of Western medicine (Towards a curvilinear comprise?) [Journal Article]. Transactions of the Royal Society of Tropical Medicine and Hygiene. 1977; 71(4): 331-334; ISSN: 0035-9203.

Note: Non-Refereed Serial; Royal Society of Tropical Medicine and Hygiene.
Philosophy, Medical.
UI 78075602.

<DEFINITION OF BIOMEDICINE> What is now termed "medicine" is, in fact, "allopathic" (or reactive) medicine, with little emphasis on prevention. All cultures of the world, including those of the West until the Industrial Revolution, are "bio-traditional" . . . . So-called Western culture has roots in many other past civilizations, but in its modern form arose in parallel with, and as a product of, the Industrial Revolution. This new Westernism can be categorized as "linear", and characteristically has a self-image of being direct, efficient-seeming, dramatic, numerically provable, speedy. It is also impatient, narrow spectrum and technology-based and, until recently, was ebullient, assured, forceful and aggressive. However, recent limitations, unexpected side effects and failures have lead in some quarters to an over-reactive scientific *anomie* unthought of 20 years ago. . . .
<OUTLINE>
1) complete or partial failure in some areas of pathology
2) increasingly common recognition of iatrogenic ill effects
3) transience of the success of some approaches
4) excessive cost and complexity, with distorted deviation of limited resources
5) awakening of awareness of the existence and potential value of some aspects of other systems of health care (e.g. Chinese acupuncture, Indo-Japanese techniques of meditation, etc.)
6) widespread reaction towards "naturalism" . . .
7) disillusionment with continuous "medical break-through" science-fiction type journalism with miracles promised, but often with little effect or consequences to the public at large
8) growing concern for health to be viewed "holistically"
9) criticism of the financial-medicalization of health It is not unreasonable, therefore, to expect to find evidence of increasing dissatisfaction with Western medicine and possible changes taking place within the biomedical model.
<end>
<CRITICISM> An important consequence of the dominance of linear Westernism has been the difficulty of having preventive medicine taken seriously . . . . <CONTRAST> They <=Bio-traditional cultures> are in considerable harmony with wider aspects of community life, including the family and spirit world.<end> . . . . <KUHN> . . . physicians as high priests . . . <end> . . . . <INTEGRATION> Fundamentally, the real need is to develop the conceptual flexibility to be able to search for curvilinear compromises-for syntheses between the best of Western medicine ("allopathy") and other healing systems, and between the direct linear technological and the improved curved bio-traditional.<end> . . . <CRITICISM> Many Pandora's boxes have been opened in recent decades-one is the delusion that linear Western science has instant, rapid breakthrough answers and solutions which are easily, widely and economically applicable.<end> <NOTE 10 self-citations out of 18, (55.56%) 15 of the references are on childbirth and children's nutrition; one might be on "science" - authors apparently developed this article from their own field research findings not from an extensive review of the philosophy of medicine>

35. Obeyesekere, Gananath (University of California, San Diego). The theory and practice of psychological medicine in the Ayurvedic tradition [Journal Article]. Culture, Medicine and Psychiatry. 1977; 1(2): 155-181; ISSN: 0165-005X.
Note: Refereed Serial.
Philosophy, Medical.
UI 79044714.

<HIGHLY DETAILED DESCRIPTIONS AND DEFINITIONS>
<ELEGANCE> The paradigm <=five *bhūtas* and three *dōsas*> itself remains unaltered to this day. <Paragraph> A highly sophisticated and aesthetically elegant theory has been constructed on the basis of these fundamental assumptions.<end>

<PURPOSE; INTRODUCE TO THE WEST> In this paper I have tried to render intelligible to a Western reader a radically different system of medicine which continues to influence the lives of millions of people in South and Southeast Asia. . . . Such a task, however, must take the theory seriously, so that experimental studies of Ayurvedic drugs should not only deal with the therapeutic value of individual ingredients, but more importantly, consider the crucial concept of *samyōga*, the balancing or matching of the ingredients.<end> . . . <RIVAL SETS> This is the case in Western psychiatry where competing and often theoretically irreconcilable therapies may be effective in curing some types of mental illness. . . . But the patient can grasp and comprehend the doctor's treatment of his illness, whereas an interpretation of his illness in a Western psychiatric idiom will be `culturally alien', and psychologically implausible to him.<end> . . . <COMPETING SETS; FALSE ASSUMPTIONS> . . . some medical ideologies and therapies may themselves be anxiety-producing and help create psychological tensions which may not have otherwise existed. Often medical ideologies define the body and its functions in ways which are false from a scientific point of view; for example, the Chinese view that blood once lost can never be replenished, or the Ayurvedic view that semen is the quintessence of bodily vitality.<end>

36. Gideon, Leonard, DVM, Ph.D. (Department of Large Animal Surgery and Medicine, College of Veterinary Medicine, Michigan State University, East Lansing, MI). Acupuncture: Clinical trails in the horse [Journal Article. Review]. Journal of the American Veterinary Medical Association. January 15, 1977; 170(2): 220-224; ISSN: 0003-1488.
Note: Refereed Serial. American Veterinary Medical Association, Presented before the Section on Large Animals, 113th Annual AVMA Meeting, July 19-22, 1976, Cincinnati, OH.
UI 77093575.

<KEY TESTS> Hopefully, the clinical success reported will encourage continued investigation of the clinical efficacy and adjunctive value of acupuncture in the veterinary profession.<end>
<OUTLINES HISTORY OF ACUPUNCTURE BY QUOTING OSLER (1892)>
<POPULARITY> In the United States, acupuncture for domestic animals became popular as the use of acupuncture for people became popular.<end> <MEDIA> The founders of the National Association for Veterinary Acupuncture, . . a group of veterinarians and medical researchers, reported to the news media . . . <end> . . . . <SCIENTIFIC SCRUTINY> Veterinary acupuncture has received little scientific scrutiny.<end> . . . . <LITERATURE> . . . <CITING A RECENT REVIEW= Davis (1975) in American Journal of Chinese Medicine> there was a fourfold increase in published reports on acupuncture. English language literature accounted for nearly one-third of all research on acupuncture. One-fifth of all reported research on acupuncture came from the United States . . . <end>

<NOTE DAVIS REPORT NOT RECEIVED THROUGH INTERLIBRARY LOAN>

<LACK OF UNDERLYING MECHANISM> Acceptance of acupuncture has been hindered by inconclusive knowledge of its mechanism of action and by inadequately controlled clinical studies.<end>
<DESCRIPTION OF THE ROLE OF CH'I <QI> AND THE MERIDIAN SYSTEM>
<INTEGRATION> I do not advocate acupuncture therapy as a replacement for chemotherapeutic management of simple colic. However, the technique may prove to be a practical alternative or an adjunct to present methods. . . . Acupuncture has been scrutinized and accepted by many veterinarians and others in the medical profession and, therefore, deserves serious and objective evaluation of its merits. Acupuncture is not a panacea. Beneficial effects from its therapeutic use are being reported by veterinarians from clinical trials. <CALL FOR CLINICAL TRIALS> Before widespread acceptance and usage of acupuncture by the veterinary practitioner, the technique should be thoroughly substantiated as being a useful clinical tool. Further research studies, both clinical and basic, are needed to answer some of the questions relating to safety, efficacy, and mechanisms by which acupuncture exerts its effects. Acupuncture principles have

influenced the physician to consider more thoroughly the means of physical diagnosis and physiotherapy.<end> It has also stimulated some physicians to seek alternative therapy for seemingly hopeless patients unresponsive to conventional therapy. Veterinary acupuncture should formally be considered as an experimental procedure until clinical efficacy has been demonstrated. If it can be shown to have merit as an adjunct to veterinary practice, acupuncture principles and theory will become part of the professional veterinary curriculum.<end>

37. Lee, Tsun-nin Lee, M.D. Thalamic neuron theory: A hypothesis concerning pain and acupuncture [Journal Article]. Medical Hypotheses. May-June 1977; 3(3): 113-121; ISSN: 0306-9877.
Note: Non-Refereed Serial.
Models, Neurological.
UI 77254409.

<GUIDING ASSUMPTIONS FAIL TO EXPLAIN> Despite many advances, the management of chronic pain remains problematical mainly because the neurophysiological mechanisms responsible for such pain are poorly understood. The recent renewed interest in the ancient Chinese healing science of acupuncture has thrown the currently prevailing pain theories into further disarray as the bulk of the acupuncture phenomena remains inexplicable by such theories. A new hypothesis is therefore required.<end> . . . . <PUZZLING; ANOMALY> The fact that stimulation of an acupuncture point can subdue chronic pain in a totally unrelated neuroanatomical region is truly puzzling. Some acupuncture points are considered to be supremely important in treating pain in certain general areas of the boy despite minimal or lack of segmental relationships . . . which, however, does not rule out their relationships in the central nervous system, or more specifically, in the highly associative thalamic nuclei. . . . . <RECONCILIATION> The TNT also provides a physiologic foundation for the acupuncture meridians <MERIDIAN SYSTEM> which have so far defied scientific explanation because they cannot be demonstrated to exist on the body surface as anatomical entities. . . . The so-called <ALLEGED> flow of Chi (vital energy) along the meridians <MERIDIAN SYSTEM> as described in classical Chinese medical literature is really equivalent to neural transmission along these neuronal chains. . . . This explains why trigger points often coincide with acupuncture loci and occur at constant anatomical locations with such high frequency. . . . In the chronic pain state, specific thalamic neurons are hyperactive prior to acupuncture stimulation whereas all the thalamic neurons are normoactive at the time of induction of acupuncture analgesia.<end> <OUTLINES THEORY OF UNDERLYING MECHANISMS>

38. Murphy, Terence M., M.B., ChB; Bonica, John J., M.D. (Department of Anesthesiology and the Pain CLinic, University of Washington School of Medicine, Seattle, WA)). Acupuncture analgesia and anesthesia [Historical Article. Journal Article]. Archives of Surgery. July 1977; 112(7): 896-902; ISSN: 0004-0010.
Note: Refereed Serial; American Medical Association.
Philosophy, Medical.
UI 77220877.

<POLITICAL FACTOR; GOVERNMENT POLICY> After the war of liberation, Mao Tse Tung encouraged an integration of Western and traditional Chinese medicine.<end> . . . . Thus, following the dramatic reports regarding acupuncture anesthesia in the People's Republic of China by B. Reston <RESTON; note error - it's James Barrett Reston> (*New York Times*, Aug. 22, 1971, section 4, p. 13) and Diamond . . , who were among the first Americans to visit that country after a quarter of a century of closed-door policy, there developed an almost incredible degree of interest in acupuncture therapy and acupuncture anesthesia. This was accompanied by many misperceptions among the American public and many physicians about the true role of the procedure. The dearth of evidence did not permit reasoned scientific judgement as to the efficacy and mechanisms, but despite this, widespread false impressions developed among Americans about the claimed success of acupuncture. This was in part due to these early reports made by

Americans, including some highly respected scientists who, though well-meaning, did not have the expertise to critically evaluate their observations.

<EARLY ADOPTERS> These misperceptions prompted a widespread interest in acupuncture and caused it to be practiced extensively by physicians, other health professionals, and "acupuncturists" in the United States and other Western countries. . . . some unscrupulous persons have exploited the public's interest by operating their acupuncture "centers" like "mills," treating several hundred patients daily and charging exorbitant fees. Moreover, the interest and curiosity of many physicians has been exploited by the numerous groups who have sponsored many courses and by a large number of acupuncture equipment companies that sell a variety of charts, needles, and "do-it-yourself kits."<end> Outside of a few well-carried-out clinical trials, most of the "studies" reported in the recent Western literature are of an anecdotal and uncontrolled nature.

Fortunately, further evidence was obtained during visits by official medical missions from several Western countries, including the United States, . . and subsequently, by the group of anesthesiologists and other scientists who visited China for an in-depth study of the use of acupuncture for clinical and other studies, now permit a more realistic appraisal of the phenomenon of acupuncture analgesia and anesthesia.

. . . . More detailed and comprehensive reviews can be found in national reports . . and the detailed accounts by Bonica. .

. . . . With the introduction of Western medicine in China, traditional medicine in general and acupuncture in particular began to fall into disrepute as being nonscientific. In 1822, the Great Imperial Medical Board ordered the virtual abandonment of acupuncture on ethical grounds. Chinese intellectuals came to regard Chinese medicine as old-fashioned and a hindrance to the modernization and development of their country. <WESTERNIZATION; SEE HERNE'S REPORTS ON JAPAN> In 1929, the Kuomintung government banned the practice of traditional Chinese medicine including acupuncture. <THIS POINT IS DISPUTED IN TRANSLATIONS OF CHINESE ACCOUNTS> . . . . The integration of traditional and Western medicine was repeatedly stressed by Chairman Mao. . . . the great proletarian cultural revolution that took place during the years 1966 to 1969 was the renewed emphasis on traditional medicine.

. . . . More contemporary acupuncture "science" views these points as aggregations of nerve endings. . . . Information with regard to its use is treating pain problems in Western patients is now accumulating. . . . <EARLY ADOPTERS> The initial reports created a great deal of excitement and interest among health-care professionals and the Chinese people for two important reasons. . . . A second and equally important reason for the interest that was generated was the fact that acupuncture anesthesia was an exclusively Chinese invention unrelated to Western medicine, which still bore the taint of "Western imperialism". Despite the initial favorable impact, acupuncture anesthesia did not become widely used as had been expected. In fact, during the early 1960s, it was virtually abandoned in many hospitals. . . . However, during the Cultural Revolution, there was a great impetus to reintroduce acupuncture anesthesia and expand its clinical use as part of Chairman Mao's movement to fully integrate Western and traditional medicine. Reports by most early visitors to China gave the lay public and medical profession of the United States and other Western countries the impression that acupuncture anesthesia was being used widely for many, if not most, operations and was highly effective in most cases. . . . The claim that acupuncture anesthesia is effective in about 90% of the patients - a figure that has been accepted in a report by many other visitors to China - is also incorrect. This is based on the personal observations of Bonica . . and others . . The traditional explanation of restoration of energy of instance is not an acceptable explanation for contemporary understanding of acupuncture. This is somewhat akin to caloric and phlogiston theories as explanations of inflammatory processes and would invoke the existence of an alternative biological system other than those of conventional physiology and anatomy.

39. Rubin, Peter, M.D. Therapeutic acupuncture: A selective review [Historical Article. Journal Article. Review]. Southern Medical Journal. August 1977; 70(8): 974-977; ISSN: 0038-4348. Note: Refereed Serial; Southern Medical Association.
References omitted.

UI 77236192.

<DATE> <caps> WHEN ACUPUNCTURE <end> was first presented to the American public in 1972, a great deal of interest was generated in this "new" yet ancient practice.<end> . . . <ANECDOTAL ACCOUNTS> . . . glowing patient testimonials were reported.<end> . . . <GROWTH AND DECLINE> In the last two years, public interest in acupuncture has declined as have the number of clinics. Research in acupuncture has continued, but the sensationalism is diminished. Now, while claims and counterclaims are made less vociferously, it would seem worthwhile . . . There may be useful medical as well as sociologic insights to be gained by such an exercise. Initially our introduction to and knowledge of acupuncture was based upon <TRAVELER'S ACCOUNTS> observations of physicians during visits to China. Because of the brevity of the trips, as well as the major differences in culture, language, and medical terminology, it was not surprising that many different opinions were expressed. Unfortunately, no American delegations have observed acupuncture as practiced in other Oriental countries, Russia, or in Eastern or Western Europe, where language and cultural barriers are less formidable.<end> . . . . <BIOMEDICAL RESEARCH> Western studies evaluating the effect of disease upon skin resistance are few.<end> . . . . <REPLICABILITY=CRUCIAL TEST> Because each treatment is individualized, replicability of methods would be difficult to produce.<end> . . . <GATE CONTROL THEORY MENTIONED BRIEFLY> <RIVAL SETS OF GUIDING ASSUMPTIONS; DATE; CHEMICALS=CRUCIAL TEST> Recently, two groups .. have found that acupuncture analgesia produced the release of endorphins, opiate-like brain peptides, from the brain of cats and mice. . . . The way in which acupuncture produced the endorphin release is, of course, not known.<end> . . . . <VALIDATION OF UNDERLYING ASSUMPTIONS> A third group has reexamined the traditional Eastern concepts of "energy" in view of the major theories of nuclear physics. The similarity between Taoism and such concepts in quantum theory as the dual nature of light, complementarity, field theory, and the interchangeability of energy and mass have been noted by many nuclear physicists, one of whom has recently compared both disciplines in depth. .. <end> . . . . <CLINICAL TRIALS; DATE> Several hundred clinical studies pertaining to therapeutic acupuncture have been published during the last four years.<end> . . . . <REPLICABILITY> One major though underestimated reason for the variability in clinical response may be the variability in the methods, training, experience, and ability of the "acupuncturist." As noted earlier, there exist significant differences between practitioners in acupuncture location, point selection, needle placement and manipulation, the use of electrostimulation, intervals between treatments, and the total number of treatments.<end> . . . . <COMMUNICATION; EXTERNAL FACTORS> There are too few hard data on acupuncture at present to justify unequivocal judgments. Communication is needed between skilled practitioners of acupuncture and competent Western clinicians. Economic, political, and legal factors will all undoubtedly affect the place of acupuncture in this country.<end>

40. Tashkin, Donald P., M.D. (Associate Professor of Medicine, UCLA Schools of Medicine and Public Health, Los Angeles, CA); Bresler, David E., Ph.D. (Assistant Adjunct Professor of Anesthesiology and Psychology, UCLA School of Medicine, Los Angeles, CA); Kroening, Richard J., M.D. (Assistant Adjunct Professor of Anesthesiology and Psychology, UCLA School of Medicine, Los Angeles, CA); Kerschner, Harvey, M.D. (Pediatric Allergy Research Fellow, UCLA School of Medicine, Los Angeles, CA); Katz, Ronald L., M.D. (Professor of Anesthesiology, UCLA School of Medicine, Los Angeles, CA); Coulson, Anne, (Senior Statistician, Lecturer in Epidemiology, UCLA School of Medicine, Los Angeles, CA). Comparison of real and simulated acupuncture and isoproterenol in methacholine-induced asthma [Clinical Trial. Journal Article]. Annals of Allergy. December 1977; 39(6): 379-387; ISSN: 0003-4738.
Note: Refereed Serial; American College of Allergy and Immunology.
UI 78078795.

<CLINICAL TRIALS> Many claims have been made concerning the therapeutic efficacy of

acupuncture. However, properly controlled clinical studies have largely been limited to treatment of pain-related disorders, . . which do not provide objective <CRUCIAL TEST> quantifiable data for analysis.<end> . . . . <ANOMALY> On the basis of other research it appears that acupuncture may be a multi-determined phenomenon involving immune-inflammatory reactions, stimulation of peripheral neural receptors and subtle psychological interactions which remain to be more clearly identified . . <end>

41. Cahn, A. M. (Département d'Endroscopie Digestive, Hôpital Saint Jacques, Besançon, France); Carrayon, P. (Département d'Endroscopie Digestive, Hôpital Saint Jacques, Besançon, France); Hill, C. (Unité de Recherches Statistiques de l'INSERM, Avenue Paul-Vaillant-Couturier, Villejuif, France); Flamant, R. (Unité de Recherches Statistiques de l'INSERM, Avenue Paul-Vaillant-Couturier, Villejuif, France). Acupuncture in gastroscopy [Clinical Trial. Journal Article]. Lancet. January 28, 1978; 1(8057): 182-183; ISSN: 0023-7507.
Note: Refereed Serial.
UI 78091069.

<PURPOSE> The effect of acupuncture in gastroscopy has never been studied.<end>

42. Chen, Gregory S., Ph.D.; Erdmann, Wilhelm, M.D. (Department of Anesthesiology, University of Alabama, Birmingham School of Medicine, Birmingham, AL). Effects of acupuncture on tissue oxygenation of the rat brain [Journal Article]. Southern Medical Journal. April 1978; 71(4): 392-395, 398; ISSN: 0038-4348.
Note: Refereed Serial; Southern Medical Association.
UI 78138788.

<HISTORICAL BACKGROUND>
<STANDARD LITERATURE REVIEW OF FINDINGS - NO COMMENTARIES>
<PRESENTATION OF CLINICAL TRIAL IN STANDARD FORMAT - NO DISCUSSION OF PHILOSOPHICAL ISSUES>

43. Janzen, John M. (Department of Anthropology, University of Kansas, Lawrence, KS). The comparative study of medical systems as changing social systems [Historical Article. Journal Article]. Social Science and Medicine. April 1978; 12(2B): 121-133; ISSN: 0037-7856.
Note: Refereed Serial.
Models, Theoretical.
UI 79014398.

<FAILURE OF MEDICAL ANTHROPOLOGY> Change of such a structure <=medical system> is rarely studied. One reason for this is that such studies fail to consider larger-scale social entities such as governmental and professional medical groups, academic medical establishments, political or popular medical movements, or economic and ecological forces as they influence individual behavior-what will here be called *macro-analysis*.<end> . . . . <POSITIVISM> . . . today's positivistic medical functionalists emphasize the unity of body, language and reality.<end> . . . . <THEORY> In the study of medical systems one could say we have moved into a Radcliffe-Brown era in the sense that exemplary field studies, of the type we shall examine below, converge around a number of elements considered basic to all medical systems . . . <end> . . . .

<VISUAL MODELS>
<MODELS> The model <=Fabrega and colleagues -"illness behavior grammar" based on rules that underlie and explain regularities in the unfolding of illnesses> is a statement about the integrated continuity of the human universe, and how discontinuity within these major sectors of integration-defined within the culture as illness-offer the comparative scholar with a basis for cross-cultural work . . .<end>. . . . <PHYSICIAN=PRIEST> The doctor is believed to be immune to and aloof from the illness or disease; he is given a status superior to the patient,

sometimes to the extent that the patient makes him an object of adoration or worship.<end> . . .
<ANTHROPOLOGICAL THEORY OUTLINED AND APPLIED>
<GOVERNMENT REGULATION; KONGO, WEST AFRICA> . . . herbal treatments and bone setting were regarded as innocuous, and tolerated. But diagnosis and divination by a prophet-seer was regarded as conflict-arousing, prone to politicize and excite the populace, therefore dangerous; it was ruled illegal. Meanwhile, Western medicine was held to be true medicine, whose clinics, hospitals, maternities and special treatment centers were subsidized by the colony, and whose professional status was governed by elaborate schools and written codes of law. . . The practice of healing (using Western medicine) without a permit and a diploma was punished by law courts. . . . *Banganga*, who had been tolerated by the colonial government, remained stigmatize and fragmented. . . . Many prophet groups organized to exert collective political and ceremonial pressure upon public policy in the new era of independence. . . . But the *banganga* began to make a come-back by 1976 enjoying the leap to legitimacy of having academic research done on them <CRUCIAL TESTS> by the Ministry of Health, in the hope of incorporating them into the national health service as a resource.<end> . . . . <POWER> Healing is an important symbol of authority wielded by all types of public figures. . . . . the *banganga* . . . meeting the growing demands for an incorporation of alternative health care personnel into the national cosmopolitan medical program. Zaire is in conformity with many African-and other-nations in this move to understand and bureaucratically control traditional health practitioners . . <end>
<INCORPORATION INTO CORPORATE STATUS>
<OUTLINES MAX WEBER>
<LEGITIMACY> The first of these types of legitimacy, <POPULAR DEMAND> popular demand or support, must be broadly understood if it is to be of help in analyzing medical systems comparatively. . . . In the modern West, traditional legitimacy is bestowed upon a body of lore or practice by the granting of funds for "scientific research", emanating either from the academic establishment with the blessing of the scientists and professionals, or from governmental agencies. . . . In the United States, research preceded the federal government's consideration to appropriate its funds for chiropractic treatment. Although the academic scientists rejected chiropractic's claims on the basis of their research, the research alone, plus the legitimacy of popular support shown by lobbyists in Washington speaking for several chiropractic groups, persuaded Congress to recognize chiropractic as a type of care deserving of Medicare insurance funds. . . <end> . . . .
<MEDICAL PLURALISM> Medical pluralism, typical of most national societies of the world, is usually characterized by the differential incorporation of several types of roles, practices, and ideologies.<end>

44. Kleinman, Arthur (Division of Social and Cross-Cultural Psychiatry, Department of Psychiatry and Behavioral Sciences, University of Washington School of Medicine, Seattle, WA). Concepts and a model for the comparison of medical systems as cultural systems [Historical Article. Journal Article]. Social Science and Medicine. April 1978; 12(2B): 85-95; ISSN: 0037-7856.
Note: Refereed Serial.
Models, Theoretical.
UI 79014403.

<OUTLINES A THEORETICAL MODEL FOR CONTRASTING MEDICAL SYSTEMS>
<EXTERNAL FACTORS> (social, political, economic, historical, epidemiological and technological) <INTERNAL> (psychophysiological, behavioral and communicative)
<MEDICAL ANTHROPOLOGY> Until very recently, medical anthropology tended to deemphasize studies of this domain, <=popular arena; non-professional healing specialists> while at the same time it overemphasized studies of the folk arena. <EXPLANATORY MODELS> Not infrequently, EMs conflict. When they do, recent evidence suggests these conflicts impede health care . . EMs construct different clinical realities for the same sickness episode, which in turn are reflected in discrepant expectations and miscommunication, and ultimately in poor clinical care.. . . . the EMs of biomedicine may structure a view of clinical reality in which the sickness is located within the body of the sick person, and care is viewed as treatment of the diseased organ

by the doctor, those of the popular culture may locate the problem in the family and my label the entire family as sick.<end> . . . . <COMMUNICATION> The explanatory model concept illuminates how problems in clinical communication frequently represent conflicts in the way clinical reality is conceived in the popular, folk, and professional arenas of the health care system; and therefore it points to the systematic entailment of these problems within that cultural system.<end> . . . . <FAILURE> . . . culturally construed conflict, previously mentioned, in which professional practitioners see sickness only as disease and proffer explanations that transmit technical information and treatments that are technical "fixes", where patients seek not only symptom relief, but also personally and socially meaningful explanations and psychosocial treatments for illness. . . . One reason why indigenous folk healers do not disappear when modernization creates modern professional medical systems is that they often are skilled at treating illness . . <end> . . . . <FAILURE OF PARADIGM> Here an autonomous anthropology of suffering and human services would offer distinct advantages not to be gained from a medical anthropology dominated by biomedical paradigms.. . . . All of which suggests that this area of medical anthropology is undergoing a shift in paradigms. The old research paradigm, built by Rivers, Sigerist, Ackerknecht, Clements, and other "founding fathers" of our discipline to conceptualize medicine in "primitive" societies, is simply no longer sufficient for integrating the more complex and sophisticated findings that are the result of an extension of our interest toward the full range of social contexts and medical systems, and toward a much wider set of concerns that the traditional biomedical issues in "medicine" . . . . . now that family medicine and primary care see social science as one of their basic sciences, it is appropriate to use medical anthropological ideas to help them construct a new paradigm for clinical practice. Another example would be reformulating the "medical model", which, as it presently stands in biomedicine, is notoriously inadequate. . . . In each case I found the biomedical paradigm to be inadequate, and the model I have discussed more useful as a research framework. The *raison d'étre* for the model is precisely to provide an alternative social and cultural model to challenge the egregiously distorting biological reductionism of the biomedical model in research and teaching . . <end>

45. Tsuei, Julia J., M.D. (Associate Professor of Public Health, School of Public Health, and Associate Professor of Obstetrics-Gynecology, John A. Burns School of Medicine, University of Hawaii, Kapiolani-Children's Medical Center, Honolulu, HI). Eastern and Western approaches to medicine [Journal Article]. The Western Journal of Medicine. June 1978; 128(6): 551-557; ISSN: 0093-0415.
Note: Refereed Serial; California Medical Association.
Philosophy, Medical.
UI 78206289.

NOTE: AUTHOR'S NAME SPELLED T-S-E-U-I in MEDLINE, -T-S-U-E-I on title page
<OBJECTIVITY> An objective comparison of Eastern and Western approaches to medicine is necessary to further evaluate the validity of Oriental medical techniques such as acupuncture.<end> . . . . <LICENSING> <caps> TWO WESTERN STATES <end> in the United States, Nevada and Hawaii, have regulated acupuncture as an independent practice not requiring medical referral or supervision . . <end> . . . <RIVAL SETS> There is, however, a great variety of contrary opinions about acupuncture within the medical profession which is reflected by the diverse legislations in many states.<end> . . . .
<DESCRIPTION; HISTORY>
<RIVAL SETS; NO COMMUNICATION> Many Westerners thought the Chinese did not know true anatomy.<end>
<OUTLINES CHINESE MEDICAL MODEL IN DETAIL>
<DEFINITIONS OF CHINESE TERMS>
<RECONCILIATION> . . . in order to keep balance between man and his environment, the meridians <MERIDIAN SYSTEM> are the communication routes. Since meridians <MERIDIAN SYSTEM> are supposed to connect nearly a thousand acupuncture points (skin receptors of

acupuncture stimuli) of the body, skin is really the reactor of the body to the surroundings. This does fit into the Western theories of cutaneous-visceral and the viscerocutaneous reflexes and the referring pain tracts.<end>

46. Chen, Gregory S., Ph.D.; Hwang, Yeou-Cheng, B.S. (Department of Anesthesiology, University of Alabama Medical School, Birmingham, AL). Two and a half years of acupuncture in Alabama. Southern Medical Journal. August 1978; 71(8): 898-903; ISSN: 0038-4348.
Note: Refereed Serial; Southern Medical Association.
UI 78250466.

<TECHNICAL ARTICLE>
<PURPOSE> The purpose of this report on the activities of the Acupuncture Clinic at UAB during the past two years and three months is to objectively assess the role of acupuncture in the treatment of various pain disorders for which <FAILURE OF BIOMEDICINE> conventional pain-relieving methods had failed to yield satisfactory results. . . . . It should be understood that this survey merely reflects an empirical study of acupuncture as it may be of value in patients with severe and stubborn pain problems. This study does not provide and was not intended to provide answers related to how and why acupuncture works.<end>

47. Crawshaw, Ralph, M.D. A lesson from Chinese medicine: A humanitarian imperative [Commentary]. JAMA: Journal of the American Medical Association. November 17, 1978; 240(21): 2257-2259; ISSN: 0098-7484.
Note: Refereed Serial; American Medical Association.
Philosophy, Medical; Coded by Medline as a "Journal Article.
UI 79030003.

<TRAVELER'S ACCOUNT> <caps> THE OCCASION <end> of our group's visit to the People's Republic of China grew out of the memory of Evans F. Carlson . . . .We visited communes where no Westerner has ever been . . . . Because our group happened to have seven physicians, a medical librarian, a nurse, and a retired medical secretary, our gracious hosts made every effort for us to visit medical facilities all along our path.<end> . . . . <RIVAL SETS> The physical resources of Chinese medicine are too different from Western medical resources to lend themselves to effective comparison.<end> . . . . <CRITICISM OF BIOMEDICINE> Suppose people began to think that physicians were interested in more than increasing either their incomes or their empires?<end>

48. Schiffeler, John Wm. (Department of the History of Health Sciences, University of California, San Francisco, CA). An essay on some of the fundamental philosophical tenets found in traditional Chinese medicine [Historical Article. Journal Article]. American Journal of Chinese Medicine. Autumn 1979; 7(3): 285-294; ISSN: 0192-415X.
Note: Non-Refereed Serial; Institute for Advanced Research in Asian Science and Medicine; Originally appeared under the same title in *Chinese Culture*, Vol. XVII, No. 4, December 1976.
Philosophy, Medical.
UI 80062377.

<MEDICAL MODEL> <caps> MEDICINE IS THAT FIELD <end> of human endeavor that is concerned with the cure, alleviation, and prevention of disease in human beings, and with the restoration and preservation of health by human beings for each other. Disease is the absence of ease, or a state of uneasiness; it is a condition of the mind and/or body, in which the basic functions are disturbed or deranged. Health is regarded as a state of well-being in which the most basic functions of human beings are duly and efficiently discharged; health, like disease, manifests itself through symptoms . . <end> . . . . <USE OF *WELTANSCHAUUNG*> The Chinese quest over the past three millennia for a harmonious union between people and their biophysical and socioanthropological environment has given rise to a *Weltanschauung* or "world concept" in which people and their way of reasoning are viewed by the Chinese practitioners as

being an integral part of the cosmos and intrinsically interjoined with the spiritual, physical, and moral "influences".<end> . . . <PARADIGM> . . . the Chinese have developed a workable, integrated, and holistic system of inductive and synthetic reasoning which forms the basis of their system of medicine. It is a system in which the definitions of medicine are inclusive, in which medical theories emphasize homogeneity, in which the therapeutical approach is grounded in continuity-bias which stresses the treatment of "`the whole man'-not merely his body, still less this or that organ." . . <quotes W.T. Jones><end>
<DEFINITIONS>
<PHILOSOPHY> The philosophy of medicine is an intellectual discipline that considers medicine in its totality by examining the position of medicine within society and in relation to different medical interpretations, beliefs, and experiences associated with its system of social intervention. . . . As Professor G.E.R. Lloyd states, "It was indeed partly by contrasting itself with magic and philosophy that medicine began to define its own identity and methods; but if it is important to see what was new in that development, it is equally important not to misconstrue or overstate the nature of that contrast or to neglect the continuing links of medicine with both." . . <end>

49. Comroe, Julius H., Jr. The WITCH doctor, the WHICH doctor, and the WISH doctor [Journal Article]. American Review of Respiratory Disease. November 1979; 120(5): 1189-1195; ISSN: 0003-0805.
Note: Refereed Serial; American Lung Association.
Philosophy, Medical.
UI 80063308.

<INFORMATION OVERLOAD; QUOTES "Practical Views on Medical Education", submitted to the members of the American Medical Association by the Medical Faculty of Harvard University, July 10, 1850>
<CRITICIZES IN DEPTH AMERICAN HEALTH CARE SYSTEM>
<FAILURE OF BIOMEDICINE><CITES *The New Yorker's* Annals of Medicine"> . . . it's now (1979) impossible for a single physician to know all that he or she <NOTE USE OF BOTH GENDER TERMS> should know about the subtle disorders of <italics> *every* <end> system and organ of the body.<end>
<CITES June 18, 1965 Master Plan submitted to Congress>
<RIGHT TO KNOW>
<EXTERNAL/INTERNAL FACTORS> Ecologists, a group of great integrity and equally great energy, conviction, and militancy, have pointed with alarm to health hazards in the air we breathe. . . . The public wants miracle drugs but has developed ambivalent feelings about them. . . . The cost of hospital care has risen so steeply that any call to concentrate on prevention of disease (rather than treating it once diagnosed) is a very appealing and legitimate one.<end> . . .
<FAILURE OF BIOMEDICINE> Medical research has made spectacular advances, but what the medical profession does *not* know is still at least as great as what it *does* know.
<FUNDING; QUOTES Belloc and Breslow (1972)> The support of fundamental biomedical research has also flagged alarmingly in the past several years.<end> . . . <SIDE EFFECTS> . . . .
<LIFESTYLE> Perhaps the greatest danger of all comes from the conviction and then fanaticism that one "life style" is more conducive to health and long life than any other and that *everyone* now has a moral and legal obligation to conform to it.<end>

50. Mahdihassan, S. (Karachi, Pakistan). Indian and Chinese cosmic elements [Journal Article]. American Journal of Chinese Medicine. Winter 1979; 7(4): 316-323; ISSN: 0192-415X.
Note: Non-Refereed Serial; Institute for Advanced Research in Asian Science and Medicine.
Philosophy, Medical.
UI 80172494.

<PURPOSE; RIVAL SETS; INTEGRATION> <caps> IT WILL BE EASILY GRANTED

<end> that a comparative study of the Indian and Chinese systems of cosmology should mutually enlighten each other.<end>
<DETAILED DESCRIPTION AND DEFINITIONS>
<VISUAL MODEL>

51. Press, Irwin (University of Notre Dame). Problems in the definition and classification of medical systems [Journal Article]. Social Science and Medicine [Medical Anthropology]. February 1980; 14B(1): 45-57; ISSN: 0160-7987.
Note: Refereed Serial.
Philosophy.
UI 80236478.

<NO PARADIGM> For Medical Anthropology, this variety <=rich diversity of experience and theoretical perspective among its representative scholars> would be a surfeit of riches indeed, if only its panorama of problem orientations and cross-culturally derived perspectives were capable of fitting within an overall unifying paradigm of health and healing. But no such paradigm exist <sic, exists> <end>
<PHILOSOPHY AND HISTORY OF MEDICINE>
<USE SIMULTANEOUSLY = H13> . . . the Western biomedical physician who uses Ayurvedic or other variant techniques and explanations to better encourage the trust and compliance of his traditionalist clients is almost always quite aware of the paradigmatic contradictions implied in the treatment strategy. He employs the variant techniques precisely because he lacks the proper tools (be these mechanical ideological or interpersonal) in his primary system of allegiance . . <end> . . . <COMPLEXITY> Western biomedicine is a complex system . . <end>
<DEFINITIONS OF FOLK, PERSONAL, POPULAR>
<USE SIMULTANEOUSLY = H13> Individuals may "mix and match" elements of various systems, but each element is popular with respect to a particular system.<end> . . . <POWER> The question of "who owns the paradigm?" - the lay or official sector> - deserves much more lengthy treatment that <sic = than> can be attempted here.<end>
<PARADIGM CHANGE> Some U.S. medical usages and intentions reveal strong adherence to the biomedical paradigm and its official proponents. Others reveal subtle dissatisfactions or developing needs and may skirt dangerously close to the limits of the paradigm. Indeed, new concepts and practices often enter medical systems via the popular sector, where the pressures for orthodoxy are weaker, and where peer, kin, ethnic and other local networks constitute the major sources of behavioral reference and anxiety relief.<end> . . . <CRITICISM> Biomedicine is frequently present only as poorly-staffed immunological and traumatological services in many peasant, primitive, and ghetto urban areas. . . . . The impersonal is Western biomedicine.<end> . . . . <POWER> Glick suggests that medical systems reflect the sources of power in a society. . . . Unschuld sees a continuum of decreasing public and family control, and increasing professional and bureaucratic monopoly of health care and sick-role legitimization.<end> . . . .
<PARADIGMS> Unfortunately, few scholars have focussed upon paradigms and themes which underlie whole medical systems and their panoply of healing tasks. . . . . Currently available thematic, world view, and paradigmatic typologies are highly subjective, largely based upon contrasts with Western biomedicine, and incapable of adequately distinguishing between other types of systems. . . . Here, the continuing search fro societal dependencies and paradigmatic models (including themes and world views) is essential. . . The study of medical systems has itself been anything but systematic.<end>

52. Lamontagne, Yves, M.D. (Research Unit, Louis-H. Lafontaine Hospital, Montreal); Annable, Lawrence, B.SC., DIP STAT (Department of Psychiatry, McGill University, Montreal); Gagnon, Marc-André, M.D., D.SC. ((Research Unit, Louis-H. Lafontaine Hospital, Montreal). Acupuncture for smokers: Lack of long-term therapeutic effect in a controlled study [Clinical Trial. Journal Article]. CMAJ: Canadian Medical Association Journal. April 5, 1980; 122(7): 787-790; ISSN: 0008-4409.

Note: Refereed Serial; Canadian Medical Association.
UI 80154994.

<LITERATURE> Although acupuncture appears to have become a popular treatment for cigarette smokers, few studies on its efficacy are to be found in the literature.<end>

53. Koh, T. C., M.B., B.S., F.F.A.R.A.C.S. (Department of Anaesthesia and Resuscitation, The Queen Elizabeth Hospital, Woodville, Australia). Chinese medicine and martial arts [Historical Article. Journal Article]. American Journal of Chinese Medicine. Autumn 1981; 9(3): 181-186; ISSN: 0192-415X.
Note: Non-Refereed Serial; Institute for Advanced Research in Asian Science and Medicine.
Philosophy, Medical.
UI 83253041.

<DEFINITION; INITIAL POPULARITY> <caps> KUNG-FU, A SYSTEM OF <end> Chinese boxing, is well-known, being popularized by the television series of the same name and also by the exploits of the late film star Bruce Lee.<end>
<HISTORICAL BACKGROUND>
<INTEGRATION> The close link between martial arts and Chinese medicine is seen in many areas, mainly in history, philosophy and in physical culture. . . . Many of these Sifu (masters) were therefore doctors of medicine.<end>
<VISUAL MODEL>

54. Fields, Howard L., M.D., Ph.D. (Departments of Neurology and Physiology, University of California, San Francisco, School of Medicine, CA). Pain II: New approaches to management [Clinical Trial. Journal Article. Review]. Annals of Neurology. February 1981; 9(2): 101-106; ISSN: 0364-5134.
Note: Refereed Serial.
UI 81205951.

<INCREASED RESEARCH ACTIVITY> Research into the basic mechanism of pain sensations increased rapidly over the past few years.<end> . . . <PLACEBO EFFECT> The great effectiveness of placebo in the treatment of pain is not widely appreciated. . . . Follow-up studies rarely reproduce the dramatic success of early reports. . . . Individuals do not, in general, have predictable responses to placebo . . , and the search for the consistent placebo reactor has been unrewarding. . . . These studies provided an impetus for larger clinical trails.<end> . . . .
<DISMISSAL OF RIVAL PARADIGM> First of all, the system of meridians <MERIDIAN SYSTEM> and detailed, highly specific effective points is apparently groundless.<end>

55. Wright, Mollie, D.V.M., M.S.; McGrath, C. J., D.V.M. (Department of Small Animal Clinical Science, College of Veterinary Medicine, University of Minnesota, St. Paul, MN). Physiologic and analgesic effects of acupuncture in the dog [Journal Article]. Journal of the American Veterinary Medical Association. March 1981; 178(5): 502-507; ISSN: 0003-1488.
Note: Refereed Serial; American Veterinary Medical Association.
UI 81215163.

<INITIAL INTEREST; DATE; EMBEDDED CLAUSAL DEFINITION> Acupuncture, a practical art of Chinese medicine for over 6,000 years, became of interest to Western medicine about 20 years ago. Since then, research has been directed toward defining both its practical uses and the physiologic explanation for its success.<end> . . . . <PURPOSE> The primary purpose of this investigation was to confirm that effectiveness in an experimental setting.<end> . . .
<FAILURE OF CURRENT MODEL> The ability of an observer to evaluate pain or lack of it is, at best, difficult, and one fault that might be found in this study is its lack of totally objective evaluation of pain response by a blind observer.<end>

56. Rappaport, Herbert (Temple University); Rappaport, Margaret (Institute for Parent/Child Services, Philadelphia). The integration of scientific and traditional healing [Journal Article]. American Psychologist. July 1981; 36(7): 774-781; ISSN: 0003-066X.
Note: Refereed Serial; American Psychological Association.
Models, Theoretical.
UI 81280126.

<RIVAL SETS = H7> Traditional healing is viewed as a distinctly different system that has a different model of disease and that operates within a different world view. . . . In the past 40 years, there has been a conceptual evolution of the Western view of prescientific systems of healing.<end> <ETHNOMEDICAL PARADIGMS> Prior to 1950, the most dominant perspective was "anthropological." Ethnomedicine was largely described to help illuminate "primitive" features of the non-Western world or of subcultures within the Western world. . . . In the 1960s, however, several researchers from different perspectives began to examine the traditional practice in terms of its own merits. . . . Moreover, the prescientific concept of illness is currently being described as rich and as of potential value to the Western scheme . . That is not to say that the preindustrial concept of disease is superior to the scientific model. Rather, this concept provides the health field in general with a model of disease and health that incorporates multiple factors. . . . <CAUSATIVE FACTORS> In the West, we are just beginning to accept the role of emotions as causative factors in the etiology of physical disease. Frank (1973) notes that the Western mind-body dualism makes it awkward for Western models of disease to handle the total person-environment system. . . . The potential richness of the traditional model of disease is still being proclaimed. . . . , a strong case was made for developing an expanded model of illness that could cut across the scientific and prescientific traditions. . . . there is a growing consensus that the African shaman should be incorporated in developing health care systems. . . . . What is needed is what humanists in the West have been asking for anyway . . , namely, that values be accepted as part of the treatment process and that there be consonance within the system. . . . The last decade has seen the emergence of a consensus concerning the role of expectancy in psychotherapy. <SCIENTIFIC TRADITION OF PSYCHOTHERAPY - NEW PARADIGM> Previously, the scientific tradition of psychotherapy and medicine tended to ignore the patient's perception of the therapist and the treatment process. . . . . He <Frank> points out that Western therapies, priding themselves on scientific rationales, tend to play down the role of expectation.<end>

57. Young, Allan (Case Western Reserve University, Cleveland, OH). The creation of medical knowledge: Some problems in interpretation [Journal Article]. Social Science and Medicine [B]. July 1981; 15(3): 379-386; ISSN: 0160-7987.
Note: Refereed Serial.
Philosophy, Medical.
UI 82084709.

<LITERATURE> Within the conventions of ethnomedical writing, there is a tendency to reduce questions about the *processes* by which informants and researchers produce their knowledge to questions about the *structure* of knowledge.<end> . . . <RIVAL SETS> There is no *a priori* reason to claim that one kind of knowledge is more authentic or autonomous than the other forms. . . . . Scientific standards are simply inappropriate in clinical settings given over to managing chronic and degenerative sicknesses, or to making decisions where clinical evidence is incomplete or ambiguous. . . Nor is science an issue where practitioners' decisions are oriented to institutional constraints and rewards . . . or where clinicians' behavior is intended to make clients tractable or to steer them away from opportunities to act or speak in emotionally disturbing or inconvenient ways.<end>

58. Curran, William J., J.D., S.M.Hyg. Law-Medicine Notes: Acupuncture, the practice of medicine, and the right to demand medical services [Journal Article]. New England Journal of Medicine.

August 20, 1981; 30520(8): 439-440; ISSN: 0028-4793.
Note: Refereed Serial; Massachusetts Medical Society.
UI 81245090.

<LEGAL CHALLENGE> The lawsuit was not brought by acupuncturists seeking to practice in the state. It was brought by 46 residents of Harris County, Texas, who claimed that their rights to be treated by acupuncturists were violated under the state's regulatory program. The judge agreed with their contentions that they had a constitutionally protected right - a right of privacy - to demand and receive acupuncture treatment, which the court found was being improperly withheld from them by the state. . . The state of Texas had tried to regulate the ancient Chinese art of acupuncture by declaring it part of the practice of medicine and thus limiting its use in patients to licensed physicians. . . . Texas court had not adequately considered the patient's right to demand acupuncture treatment when it was not available. <new paragraph> Acupuncture began to receive attention in Texas and elsewhere in this country during the mid-1970s, after the opening up of China to the United States. . . . Judge McDonald needed to hear no more. He concluded that the limitation imposed under Texas law had the effect of preventing the practice of acupuncture in the state. The petitioners were thus deprived of their right to receive such treatment by a regulatory limitation that was not "necessary" to protect the health of the people of Texas.<end> . . . <PERSONAL FACTORS> The most disturbing part of this decision from a legal observer's standpoint is that the judge seemed to feel compelled by his own reasoning to strike down an entire regulatory area, thus allowing any and all comers <CREDENTIALS> professing skills in Chinese acupuncture to exploit patients whom the judge himself described as <FAILURE OF BIOMEDICINE> desperate people who had not found relief or cure under accepted Western medicine.<end> . . . <LACK OF KNOWLEDGE> . . . so little about acupuncture seems to be known in Texas. All persons seeking such licenses would have to be trained in other countries or at the few centers in the United States where nonphysicians can receive training.<end>

59. Finckh, Elisabeth, M.D. (Hamburg, Germany). Tibetan medicine: Theory and practice [Journal Article]. American Journal of Chinese Medicine. Winter 1981; 9(4): 259-267; ISSN: 0192-415X.
Note: Non-Refereed Serial; Institute for Advanced Research in Asian Science and Medicine.
Philosophy, Medical.
UI 83253052.

<TRAVELER'S ACCOUNT; MOTIVATION; CURIOSITY> For twenty-five years now I have been studying and also practicing Asian methods of treatment. My interest in Tibet began when I was young and it was a pure and simple curiosity to learn more about a topic on which <LITERATURE> hardly any books existed, which led me to grasp the first available opportunity to get into contact with Tibetan doctors after <EXTERNAL FACTORS> political developments in Tibet had made this possible. . . . <KEY LEADERS> His Holiness the Dalai lama, who granted me a long private audience and directed his personal physician, Yeshe Donden, to explain everything to me.<end>. . . . <LANGUAGE BARRIER> . . . my knowledge of the Tibetan language proved to be inadequate. However I did come to realize that Western doctors will never be able to understand Tibetan medicine, to them a totally unfamiliar field, without oral instruction by Tibetan doctors.<end> . . . <CROSS-CULTURAL MISCOMMUNICATION> When acupuncture, <CLAUSAL DEFINITION> another Asian method of healing, was introduced in the West - and it has in the meantime acquired academic recognition in the universities and been tried out and put into practice - several mistakes were made: <STAGES OF DIFFUSION> the help of Sinologists in the translations of important Chinese medical works was called in far too late; this method of healing was applied far too soon and too much time was wasted on unnecessary philosophical speculations; and finally there was, right from the start, no adequate medical terminology.<end> . . . <COSMOLOGY; BARRIERS TO HOMOPHILY = H7> Tibetan medicine is interwoven with Buddhism and therefore a good knowledge of Buddhism, particularly Tibetan Buddhism, is vital. Above all, one should also take into account pre-Buddhist influences

. . such as the ancient Tibetan Bon-religion and shamanism.<end> . . . . <NO COMMON LANGUAGE> This world of analogies, of corresponding phenomena, in which fine sub-strata of non-material nature make possible an interaction of body and mind cannot be compared to our Western concepts and can hardly be explained in Western terms. . . . we should not approach this Asian method of healing with our Western concepts.<end>
<DETAILED DESCRIPTION AND DEFINITION>
<ORIENTALISM> In the West interest in Tibetan medicine is particularly great, and for exactly this reason in an age like ours which is only too willing to try out Oriental practices and miracle drugs . . . <end>
<ONLY 4 REFERENCES; NO REFERENCE TO Ven. Rechung Rinpoche's *Tibetan Medicine* first published in 1973 - 8 years prior to this article's publication>

60. Zhou, Da-Hong, M.D. (Department of Physical Medicine and Rehabilitation, Zhongshan Medical College, Guangzhou, China). Preventive geriatrics: An overview from traditional Chinese medicine. American Journal of Chinese Medicine. 1982; 10(1-4): 32-39; ISSN: 0192-415X.
Note: Philosophy, Medical; Institute for Advanced Research in Asian Science and Medicine.
UI 83227977.

<DISMISSAL> In medical and Taoist writings, about a dozen methods have been introduced as esoteric ways to increase life span. With the enlightenment of science, such superstitious, foolish and worthless methods as healing by charms and "remedial sex" have been eradicated, but the time-honored and useful methods continue to find their way to refinement and popularity. <RECONCILIATION> The scientific basis of these methods is being gradually unveiled. It is thus reasonable to expect that traditional Chinese medicine will continue to make its contribution to the world with its valuable insight into the promotion of longevity. . . . . Scientific studies on the rationale of these techniques <=breathing exercises, heliotherapy, gymnastics, alchemy, medication and diet> have justified their application.<end>

61. Churchland, P. S. (University of Manitoba, Winnipeg, Manitoba, Canada). Mind-brain reduction: New light from the philosophy of science [Journal Article]. Neuroscience. May 1982; 7(5): 1041-1047; ISSN: 0306-4522.
Note: Refereed Serial.
Philosophy.
UI 82272905.

<PARADIGM CHANGE; POSITIVISM + REDUCTIONISM> Part and parcel of this shift in perspective is the broader view that philosophy at its best and properly conceived is continuous with science, differing from the specific scientific disciplines mainly in its scope and generality, but not in its ultimately empirical and testable nature. . . . `Reductionism' has unfortunately become something of a `boo' word in some quarters, apt to connote a scorn for humankind or a disdain for moral conceptions based on notions of responsibility and deliberation. Doubtless, such recently acquired connotations are owed in part to the fact that Skinner vociferously proclaimed himself a reductionist and his favoured hypothesis of what form the reduction of folk psychology would take was not only empirically far-fetched, but was frequently accompanied with bombastic prophecies designed to shock and outrage. Additionally, it is a stock rhetorical tactic practised by hide-bound devotees of the `non-physical mind' to cast reductionists in the villain's role . . Chilling connotations aside, reduction is essentially just a relation between theories and if one phenomenon is said to be reducible to another, this is in virtue of the theory which describes that phenomenon reducing to a more fundamental theory.<end>
<OUTLINES KUHN WITHOUT EVER CITING HIM; 5 SELF-CITATIONS; CITES Feyerbend, Popper>

62. Watkins, Linda R. (Instructor); Mayer, David J. (Professor) (Department of Physiology, Medical College of Virginia, Virginia Commonwealth University, Richmond, VA). Organization of

endogenous opiate and nonopiate pain control systems [Journal Article. Review]. Science. June 11, 1982; 216(4551): 1185-1192; ISSN: 0036-8075.
Note: Refereed Serial; American Association for the Advancement of Science.
UI 82199446.

<NO DEFINITIONS; ACUPUNCTURE INCLUDED ALMOST ON EQUAL STATUS> <RECONCILIATION> The belief that counterirritation - an acute, painful stimulus - can be used to alleviate ongoing pain has been held since antiquity . . This procedure has a great deal in common with acupuncture and transcutaneous nerve stimulation.<end>

63. Wu, Jin-yi (Laboratory of Fundamental Theories, Chengdu College of Traditional Chinese Medicine, Chengdu, China). Neijing chronobiologic medical theories [Journal Article]. Chinese Medical Journal. August 1982; 95(8): 569-578; ISSN: 0366-6999.
Note: Refereed Serial.
Philosophy, Medical.
UI 83052518.

<DATE> During the last 2 decades, study of chronobiology has rapidly developed to a new stage characterized by research on human biologic rhythms and their far-reaching influences upon modern medicine.<end> . . . <DEFINITIONS> Chronobiologic medicine is an important and organic part of traditional Chinese medicine (TCM). . . . The theory of chronobiologic medicine in TCM is based on the view that people and nature are in unity.<end>
<HIGHLY TECHNICAL LINKS - cyclic nucleotides and yin-yang>
<TABLE OF 5 VISCERA - CIRCADIAN RHYTHMS - TIME OF DEATH>
<LACK OF INFORMATION> As Chinese chronobiologic medicine has been restricted by the historical conditions, it has been unjustly negated and of course has also been adulterated by some erroneous concepts which are in the process of being winnowed out. TCM belongs to all mankind and during the new flowering of chronobiology, will contribute much to modern chronobiologic medicine.<end>

64. Johnson, Donald A., M.D., Ph.D. History and the understanding of acupuncture anesthesia [Historical Article. Journal Article]. Southern Medical Journal. April 1983; 76(4): 497-498; ISSN: 0036-4348.
Note: Refereed Serial; Southern Medical Association.
UI 83171679.

<DATE; INITIAL INTEREST; ORIENTALISM> When things Chinese attracted the attention of American medicine in 1971, a review . . . <end> <DISAPPEARANCE FROM THE LITERATURE> But it <=acupuncture as observed in 1836> was not investigated, and with the advent of ether anesthesia, the observations were no longer made and the subject disappeared from the literature. It did not come to investigative attention until 1971, when it reappeared as acupuncture anesthesia.<end> <TRAVELER'S ACCOUNTS> In 1971 China was "opened," and visiting American physicians returned to this country extolling the virtues of acupuncture anesthesia and predicting wide adoption of it.<end> . . . <HISTORICAL PERSPECTIVE> A historical perspective would have widened the interpretive horizon.<end>

65. Lewith, George T. (Aldermoor Health Centre, Aldermoore Close, Southampton, Great Britain); Machin, David (Primary Medical Care and Community Medicine, University of Southampton, Southhampton, Great Britain). On the evaluation of the clinical effects of acupuncture [Clinical Trial. Journal Article. Review]. Pain. June 1983; 16(2): 111-127; ISSN: 0304-3959.
Note: Refereed Serial.
UI 83272594.

<NOTE: Adlermoor Health and Aldermoore Close - both spellings used>

<LITERATURE> Much of the work that discusses the clinical effectiveness of acupuncture is descriptive and therefore of limited value. It is essential that clearly <CRUCIAL TESTS> controlled, randomised clinical trials become available before this technique is accepted, or rejected.<end>
<DEFINITIONS>
<PURPOSE; LITERATURE; CONTROVERSY=DEBATE> These therapeutic controversies are far from resolved and many hypotheses are both unproved and untested and so the discussion in this paper has been deliberately limited to the statistical methods that can be employed to evaluate the clinical effects of acupuncture.<end>
<NATURAL COURSE OF DISEASE> A clear knowledge and understanding of the natural history of the disease being studied is essential before constructing any trial.<end> . . .
<CRUCIAL TESTS> . . . it is almost impossible to construct a satisfactory double blind trial involving acupuncture.<end> . . . . <PAIN; NO POSTULATES> It is important to understand that no clear objective methods of assessing chronic pain are currently available.<end> . . . .
<META-ANALYSIS> Nevertheless it is quite clear that the majority of these trials are too small to achieve their anticipated ends and the case for or against the efficacy of real acupuncture has not yet been argued coherently.<end>

66. Tung, May, Ph.D. Life values, psychotherapy, and East-West integration [Journal Article]. Psychiatry. August 1984; 47(3): 285-292; ISSN: 0033-2747.
Note: Refereed Serial.
Philosophy.
UI 84298699.

<TRAVELER'S ACCOUNT> During the last decade, numerous Western mental health professionals have visited People's Republic of China (PRC). . . . Most of these reports are descriptive. . . . My information is based on visits which I made in 1979.<end> . . . . <RIVAL SETS> On the surface it appears that Chinese psychiatric practice totally disregards confidentiality, whereas in the United States confidentiality is almost holy.<end>
<DETAILED DESCRIPTION OF CHINESE MODEL; DEFINITIONS>

67. Gillick, Muriel R., M.D. (Bunker Hill Health Center of the Massachusetts General Hospital). Common-sense models of health and disease [Occasional Notes. Journal Article]. New England Journal of Medicine. September 12, 1985; 313(11): 700-703; ISSN: 0028-4793.
Note: Refereed Serial; Massachusetts Medical Society.
Philosophy, Medical.
UI 85267907.

<PARADIGMS; MEDICAL MODELS> The "biomedical model," which serves as the foundation of contemporary, Western, scientific medicine, has at its core biologic theory, which seeks to explain the causes, pathophysiology, and course of illness. . . It is the logic of this theory that dictates the physician's approach to the diagnosis and treatment of disease. Many middle-class, educated Americans think about illness - its cause and its cure - in ways that are alien to those of their physicians. . . . . Moreover, I suggest that this incongruity between the models of the patients and physicians may account for the widely reported dissatisfaction of patients with modern medicine - a phenomenon variously attributed to subspecialization and the concomitant disappearance of the healing role . . or to the impersonality of medical technology . . In fact, the yearning of patients for a family doctor who is at once friend, father, and physician may represent nostalgia for the days before the triumph of scientific medicine, when patients and physicians did indeed share a similar view of the body and of the mechanisms that determine health and disease. . . <end> . . . . <POPULAR LITERATURE> A few suggestive examples of the models of disease espoused by the middle class in the United States today can be found in magazines such as *Prevention* and in the published reflections of writers such as Norman Cousins and Adelle Davis. . . . One model of illness and health that is embedded in the popular health literature

depicts the human being as an organism struggling to maintain its integrity in the face of constant threats from malevolent forces that may be external (toxins and microorganisms) or internal (emotions such as anxiety or fear). . . <end> . . . . <WIDESPREAD POPULARITY> How widespread are popular models of disease? Statistics concerning the circulation of magazines and copies of books sold do not reveal the actual impact of these ideas. Nonetheless, the statistics are sufficiently dramatic to suggest that common-sense views of disease have achieved wide currency and almost surely play a part in shaping the beliefs of those who are exposed to this literature. <new paragraph> Health magazines are to be found in health-food stores and natural-food stores.<end>
<LISTS TITLES>
<CITES GEORGE ENGEL>
<CLASH BETWEEN PATIENT'S MODEL AND PHYSICIAN'S>
<DISSATISFACTION; BARRIERS TO COMMUNICATION> It is the lack of communication that may be at the root of patients' dissatisfaction with modern medicine. However, if the gulf between the two models is sufficiently deep, physicians may not be able to modify their patients' mistaken notions, because they are part of an entire system of thought.<end>

68. Rosenfield, Louis (Department of Pathology, New York University Medical Center, NY). The last alchemist--The first biochemist: J. B. van Helmont (1577-1644) [Historical Article. Historical Biography. Journal Article]. Clinical Chemistry. October 1985; 31(10): 1755-1760; ISSN: 0009-9147.
Note: Refereed Serial; American Association for Clinical Chemistry.
Philosophy, Medical.
UI 86002754.

<HISTORICAL PERSPECTIVE: alchemists as "fantastic humbugs"; "obsession with secrecy"; "vitriolic attacks on the medical profession"; rejection of the 4 elements; first chemically derived drugs - 16th c.>
<EARLY EXAMPLE OF PARADIGM SHIFT; INFLUENCE OF ONE INDIVIDUAL>

69. Aakster, C. W. (Socioloog, Adviseur Gezondheids welzignszorg, Dwingeloo, The Netherlands). Concepts in alternative medicine [Journal Article. Review.] Social Science and Medicine. 1986; 22(2): 265-273; ISSN: 0277-9536.
Note: Refereed Serial.
Models, Biological.
UI 86179985.

<QUACKERY> Medical sociologists are gradually becoming aware that at least two realities exist within Western health practice: the official and the unofficial, the legal and the illegal, the bright, scientific and heroic hospital doctor vs the unscientific therapist or quack.<end> . . .
<DEFINITIONS AND DESCRIPTION OF EACH THERAPY>
<NO THEORY> Conventional medicine has no general theory of disease and its development/management. It has theories on the development of mental illness, of infectious diseases, of coronary heart disease, but none of disease in general.<end> . . . . <PATIENTS> Talcott Parsons described the ideal patient of conventional medicine, the one who does not ask questions and follows orders.<end> . . . . <INTEGRATION; CONTROVERSY=DEBATE> There is universal controversy between conventional (Western) medicine and alternative (indigenous) therapies, though in some cases a certain integration has been achieved. . <end> . . . . <ERRORS> Burckhardt and Kienle . . , after scrutinizing about 1000 German scientific publications, found that only 2-5% of the reported investigations were without mistakes.<end> . . . . <RIVAL SETS> In conventional medicine the emphasis is on research aspects: if one intends to perform a scientific investigation, the therapeutic process has to be adjusted to the procedures of scientific investigation. In alternative medicine, the *therapeutic process* is the starting point: it is strongly believed that research should not cause any disadvantage to the patient: the

requirements of research must be accommodated to the needs of treatment . . . . Now, considering the fact that conventional medicine imposes its method of scientific proof (which itself has methodological, theoretical, practical and ethical shortcomings) on alternative medicine - even without a willingness to seriously discuss alternative methods - the question arises: why? Why does conventional medicine require that the alternative and more holistic approaches have to be tested by its own analytical methods? <CONTROVERSY=DEBATE> This question leads of necessity to the heart of the controversy.<end>
<CITES FEYERABEND: Rediscovery of acupuncture>
<DISSATISFACTION> Feedback to society causes dissatisfaction. . . . But, the problems escalate (the people ask for tender loving care, but get more drugs and techniques): more cancer, more mental disease, more heart infarctions, traffic accidents, suicides, addictions.<end>

70. Weiss, Mitchell G. (Harvard Medical School, Department of Social medicine and Health Policy and Department of Psychiatry at The Cambridge Hospital, Cambridge, MA); Sharma, S. D. (Central Institute of Psychiatry, Ranchi, India); Gaur, R. K. (Institute of Medical Sciences, Banaras Hindu University, Varanasi, India); Desai, A. (King Edward Memorial Hospital, Bombay, India); Doongaji, D. R. (King Edward Memorial Hospital, Bombay, India). Traditional concepts of mental disorder among Indian psychiatric patients: Preliminary report of work in progress [Journal Article]. Social Science and Medicine. 1986; 23(4): 379-386; ISSN: 0277-9536.
Note: Refereed Serial; A brief version was read at the Second International Conference on Traditional Asian Medicine, Surabaya, Indonesia, September 2-7, 1984.
Models, Theoretical.
UI 86316026.

<CODE SWITCHING; PLURALISM> The world view which allows the layman in this pluralistic setting <India> to shift easily from one to another conceptual mode holds that there are potentially many causes of a single affliction, that different kinds of treatment interventions can be effective, and that pragmatic considerations within the cultural context may lead to the choice of one, another, or several options to deal with a given problem. . . . . The relationship between Ayurveda and allopathy has been characterized by competition among the practitioners, but patients tend to view them as more or less appropriate and interchangeable alternatives in a specific situation.<end>

71. Vincent, C. A. (Department of Psychology, University College London, England); Richardson, P. H. (United Medical and Dental Schools of Guy's and St. Thomas' Hospitals, St. Thomas' Hospital, London, England). The evaluation of therapeutic acupuncture: Concepts and methods [Review Article: Clinical Trial. Journal Article.] Pain. January 1986; 24(1): 1-13; ISSN: 0304-3959.
Note: Refereed Serial.
UI 86148059.

<DISMISSAL; RIDICULE> Many people have commented on the strangeness <=NEGATIVE JUDGEMENT> of these ideas <=MERIDIAN SYSTEM> and the lack of supporting scientific evidence . . <end> . . . <NO HOMOPHILY> Behind the unfamiliar concepts and apparently bizarre approaches to treatment are descriptions of clinical states which amount to diagnostic categories and a series of prescribed interventions aimed at restoring health. No attempt is made to postulate an underlying cause of the symptoms and there has been little attempt at serious evaluation. For such reasons traditional acupuncture cannot be considered scientifically based.<end> . . . . <USE BUT DON'T ACCEPT UNDERLYING ASSUMPTIONS = H13> We may contrast the traditional acupuncturist with those practitioners in both the East and the West who use orthodox Western diagnoses and a corresponding prescription or `formula' of classical acupuncture points for each dysfunction or disease. Where this approach is taken, the choice and location of points will usually have been derived from traditional Chinese ideas about illness even though the practitioners may no longer subscribe to them.<end> . . . . <CREDENTIALS> To a

traditional acupuncturist much of the acupuncture that is practised in the West is akin to unqualified persons handing out antibiotics at random to sick people. . . Seen from this perspective traditional acupuncture has been reduced by many Western practitioners to its bare essentials and is very often administered by relatively unskilled practitioners. . . <end> . . . . <CRUCIAL TESTS> Reports of uncontrolled clinical trials of acupuncture abound in the medical literature.<end> . . . . <POSTULATES> This has been the test of choice of any study asking whether specifically (sic? specific) classical ideas have anything to contribute.<end> . . . . <CRUCIAL TESTS> It has been axiomatic amongst researchers for years that the most appropriate paradigm for drug evaluation research is the randomised placebo-controlled double-blind trial. . . . Whether double-blind methodology can be applied adequately to the investigation of the therapeutic effects of acupuncture is questionable. . . . . With rare exceptions the studies reviewed in the following paper have made at least some attempt to obtain follow-up data, although in some cases it is rather rudimentary.<end>

72. Richardson, P. H. (United Medical and Dental Schools of Guy's and St. Thomas' Hospitals, St. Thomas' Hospital, London, England); Vincent, C. A. (Department of Psychology, University College London, England). Acupuncture for the treatment of pain: A review of evaluative research [Review Article. Clinical Trial. Journal Article]. Pain. January 1986; 24(1): 15-40; ISSN: 0304-3959.
Note: Refereed Serial.
UI 86148061.

<CRUCIAL TESTS> The results of large scale uncontrolled studies of this sort can of course make only a limited contribution to the evaluation of the clinical effectiveness of acupuncture since we have no way of knowing about the possible progress of the patients concerned in the absence of any form of treatment.<end>
<EXTENSIVE LITERATURE REVIEW>

73. Fabrega, Horacio, Jr., M.D. (Department of Psychiatry and Anthropology, University of Pittsburgh School of Medicine). An ethnomedical perspective of Anglo-American psychiatry [Journal Article. Review. Review, Academic.] American Journal of Psychiatry. May 1986; 146(5): 588-596; ISSN: 0002-953X.
Note: Refereed Serial; American Psychiatric Association.
Philosophy, Medical.
UI 89226055.

<DOMINANCE> Medicine in contemporary Anglo-American society <FIRST USE CLARIFYING DISTINCTIONS IN A MULTICULTURAL NATION> is dominated by the biomedical theory of illness. . . . . it is arguable whether the explanatory models of biomedicine are appropriate.<end> . . . . <EXTERNAL FACTORS> Viewed ethnomedically, what stands out in this history is the importance of political and economic factors (social, policing and rehabilitation, for example), the concomitant, heavy emphases on rationalizing symbols and/or ideologies (involving moral worth and humanitarianism, for example), and the dominance of the state in the way the psychiatrically ill were handled.<end> . . . . <LACK OF INFORMATION> We lack information on how the psychiatrically ill were handled in other civilizations.<end> . . . . <CRITICISM; REDUCTIONISM> . . . medicine has become a quintessentially abstract, impersonal, and secular enterprise. . . . . It is only a narrow and reductionistic use of the biomedical theory that deludes us into thinking that medicine is purely a technical and engineering enterprise and that social-psychological aspects of behavior should be the concern of nonmedical personnel. <ETHNOCENTRICISM> The rootedness of psychiatry-related activities in ethnomedical verities could be countered by arguing that what happens in "primitive" or nonmodern societies is exotic, romanticized, or simplistic, far removed from the "evolved" and the "scientific". But this is to reason chauvinistically and ethnocentrically. . . . . Biomedical science is unquestionably impersonal, abstract, and technical, but its theories and the knowledge it

produces lead to positive changes in the social system that ameliorate conditions which produce disease. . . . . <BIOMEDICINE VIEWS ITSELF AS "CULTURE-FREE"> The power of biomedicine lies in its political neutrality; that is, its ability to deal with phenomena through a language relatively uncluttered and uncontaminated with prevailing social problems and cultural biases. (This in no way vitiates the claim that biomedical tenets are themselves cultural and hence integral to contemporary notions of self, personhood, and social reality. . . . . It is true that medicine can and has expounded misguided and pernicious treatment strategies, but this only emphasizes the need for a prudent regulation of medical practice, not the failures of biomedicine.<end> . . . . <CULTURAL BIAS> Johnson and Swartz drew attention to cultural biases implicit in positivistic biomedical psychiatry: the myth that its categories and objects are neutral or objective and hence scientific because they can (in some instances) be shown to have a biological core.<end> . . . . <UNDERLYING ASSUMPTION> Anglo-American psychiatry's mentalistic bias (and minimization of the somatic . . . <end> . . . . <ETHNOCENTRICISM> . . . its <=Anglo-American psychiatry> gross disregard of its own ethnocentric assumptions and the ethnopsychological theories of other societies. . . . illusion of biomedical neutrality and impersonality is being used to export illnesses internationally, as though they constituted universal entities, when in fact such illnesses are partly the product of Anglo-American social and cultural conventions. . . . . Contemporary developments involving the nosology and epidemiology of psychiatric illness reflect cultural biases inherent in the social "problematique" of Anglo-American psychiatry and should ideally be recognized.<end>

74. Montgomery, Robert A. Modernizing medicine with lessons from an ancient healing art [Journal Article]. The Pharos. Summer 1986; 49(3): 6-11; ISSN: 0031-7179.
Note: Non-Refereed Serial.
Philosophy, Medical.
UI 86314152.

<FAILURE> I had traveled overseas with a clear understanding of how an integrative approach to health care, with tractional healers working in concert with Western physicians, could improve the collective health of Africa. There are clear indications that neither system alone has the philosophical or logistical orientation suited for the task of delivering even a minimum standard of health care to Africa's rural populations. . . . I had not asked myself what the healers of Africa have to offer us in Western medicine.<end> . . . . <MEDICAL MODEL> It is apparent that the manner in which physicians interact with their patients is profoundly influenced by the prevailing medical model of their time.<end>
<CITES GEORGE ENGEL>
<CRITICISM> In the short time since its inception, what has come to be known as "defensive medicine" has evolved from the <COSTS> costly and inefficient practice of ordering nonessential tests to the systematic prescreening of patients' backgrounds to see if they carry the "scarlet letter" of past malpractice claims. The day seems close at hand when patients will use similar computer software to tally the malpractice suits brought against a potential health care provider. . . . Large, profit-seeking conglomerates are rapidly buying control of the system - pushing where it will become more responsive to the rules of the marketplace than to the unique circumstances of the individual patient. . . . <RESIDENCY TRAINING=DEHUMANIZATION; SEE SERIES "MEDICINE AT THE CROSSROADS"- IMPACT OF SLEEP DEPRIVATION ON RESIDENTS AT JOHN HOPKINS> The impact of the biomedical model and recent societal patterns is lucidly reflected in medical education. . . . During residency training, long hours and unreasonable demands force genuine patient involvement down the ladder of priorities. Patients are distanced and dehumanized to the point of being referred to as "interesting cases" - as if they were oversized culture flasks whose contents could be systematically analyzed and appropriately adjusted to produce health where pathology had once flourished. . . . By embracing a medical model that does not formally incorporate the psychosocial aspects of a patient's clinical presentation, we run the risk of making suboptimal or inappropriate therapeutic interventions. <IMPERSONAL> There are no provisions within the framework of the current medical model for

the homogenization of important information about the patient - his family, occupation, ethnic background, religious beliefs, and interpersonal relationships - revealed in data obtained through thorough history taking and signs ascertained through physical examination. . <end> . . . . <ANOMALY> How are these people <=African traditional healers> able to treat so many illnesses successfully without the knowledge and techniques that we consider absolutely indispensable and essential to the practice of medicine?. . . . Why are Western physicians unable to treat so many illnesses adequately when they are indeed privy to this information<=same information traditional healers are given by the patients><end> . . . . <FAILURE> The irony is that although we now possess knowledge and techniques in medicine that were unfathomable one hundred years ago, we have traded off some of our most effective, time-tested healing strategies.<end>

75. Lehmann, Thomas R. M.D.; Russell, Daniel W.; Spratt, Kevin F.; Colby, Hutha; Liu, Y. King; Fairchild, Mary Lou; Christensen, Stanley (Department of Orthopaedic Surgery, University of Iowa, Iowa City, IA). Efficacy of electroacupuncture and TENS in the rehabilitation of chronic low back pain patients [Clinical Trial. Journal Article]. Pain. September 1986; 26(3): 277-290; ISSN: 0304-3959.
Note: Refereed Serial.
UI 87040360.

<NO DEFINITIONS; NO HISTORICAL BACKGROUND; NO PASSAGES ADDRESSING THE ISSUES SURROUNDING ACUPUNCTURE>
<FORMAL CLINICAL TRIAL FORMAT>

76. Fung, Kam Pui; Chow, Olivia Kit Wun; So, Shun Yeung (Department of Paediatrics and Medicine, Queen Mary Hospital, University of Hong Kong, Hong Kong). Attenuation of exercise-induced asthma by acupuncture [Clinical Trial. Journal Article.] Lancet. December 20-27, 1986; 2(8521-8522): 1419-1422; ISSN: 0023-7507.
Note: Refereed Serial.
UI 87063110.

<BACKGROUND> <caps> ACUPUNCTURE <end> has been used in the treatment of various diseases in China for more than two thousand years. . <end> . . . <CRUCIAL TESTS; PURPOSE> There have been few properly controlled studies on experimental asthma. . . . . Further studies are now indicated to explore the efficacy of acupuncture as an adjunct therapy in acute asthma and control of chronic severe asthma. < EXPLANATORY POWER> In addition, investigation of the mechanism by which it works may lead to better understanding of the pathophysiology of asthma.<end>

77. Jobst, Kim (Osler Chest Unit, Churchill Hospital, Oxford, England); Chen, Jing Hua (Department of Respiratory Medicine, Friendship Hospital, Peking, China); McPherson, Klim (Department of Community Medicine and General Practice, University of Oxford, England); Arrowsmith, Jill (Osler Chest Unit, Churchill Hospital, Oxford, England); Brown, Vivienne (Leamington Spa, Warwickshire, England); Efthimiou, John (Osler Chest Unit, Churchill Hospital, Oxford, England); Fletcher, Hilary J. (Osler Chest Unit, Churchill Hospital, Oxford, England); Maciocia, Giovanni (Chesham, Buckinghamshire, England); Mole, Peter (Oxford Acupuncture Centre, Oxford, England); Shifrin, Ken (Oxford Acupuncture Centre, Oxford, England); Lane, Donald J. (Osler Chest Unit, Churchill Hospital, Oxford, England). Controlled trial of acupuncture for disabling breathlessness [Clinical Trial. Journal Article.] Lancet. December 20-27, 1986; 2(8521-8522): 1416-1419; ISSN: 0023-7507.
Note: Refereed Serial.
UI 87063109.

<NO DEFINITIONS>

<CONTROVERSY=DEBATE; PURPOSE> Although there is controversy about whether acupuncture of any form has more than a placebo effect and it has even been suggested that it is based on irrational principles . . one can equally argue by inference from the work on acupuncture, pain, and endogenous opiates that acupuncture might be able to alter the perception of breathlessness and sensations of distress in patients with COPD.<end> . . . . <TECHNIQUES> Some local practitioners have the necessary diagnostic and technical skills to conduct this treatment but it is possible that in less experienced hands such patients might not improve and might even deteriorate.<end>

78. Cai, Jingfeng (China Academy of Traditional Chinese Medicine, Beijing, China). Toward a comprehensive evaluation of alternative medicine [Journal Article. Review. Review Tutorial.] Social Science and Medicine. 1987; 25(6): 659-667; ISSN: 0277-9536.
Note: Refereed Serial.
Philosophy.
UI 88070804.

<SIDE EFFECTS = 'iotrogenic'; DEFINITIONS>
<RIDICULE> Health care administrators in almost all states in the world are trained in the western style and, as a rule, tend to view TM as backward and non-scientific, a notion which has a profound and extensive influence. . . . Some authors, when writing about the experience gained by traditional physicians apply such terms as 'allegedly', 'is said', showing a remarkable antipathy against TM.<end>. . . . <CRUCIAL TESTS> Verification of the therapeutic effect of TM is an essential problem in its evaluation.<end> . . . . <THEORIES> Since the theories of AM <=alternative medicine> are based principally on ancient philosophy, <=SUPERSTITION> it is not realistic to assess and investigate by disregarding them.<end> . . . . <RIDICULE; YIN-YANG> We have encountered some opponents who have attacked TM as being non-scientific, claiming the Yin-yang principles and five elements, organography and channel as neither perceptible nor tangible.<end> . . . . <HEALTH SEEKING BEHAVIOR> Nevertheless, health seeking behavior is complex too, being influenced by a number of factors including folklore, influence from relatives or friends, location of residence, medical facilities, certification of medical personnel, and accessibility. Even the mass media might play an important role in this regard.<end>

79. Farquhar, Judith (Department of Anthropology, University of North Carolina, Chapel Hill, NC). Problems of knowledge in contemporary Chinese medical discourse [Journal Article.] Social Science and Medicine. 1987; 24(12): 1013-1021; ISSN: 0277-9536.
Note: Refereed Serial.
Philosophy, Medical.
UI 87319757.

<WESTERN TRADITION> The western epistemological tradition approaches knowledge from the point of view of an isolated observer, to whose consciousness the representation of the world, the very knowability of things, is problematic.<end>
<CITES MANFRED PORKERT>
<ETHNOCENTRICISM> Western scholarship of the non-Western sciences tends to invoke ethnocentric notions of what science is and how it generates certain knowledge. . . . . Ironically, the anthropological devaluation of native knowledge is undertaken in the name of its humanistic valorization as myth. Most anthropological and epistemological investigations thus return us to our starting point: we may be aesthetically enriched, but we have learned nothing about the wider human character of healing knowledge and action from the encounter with others.<end>

80. Patel, Mahesh S. (Institut Universitaire de Médecine Sociale et Préventive, Services de Santé, Lausanne, Switzerland). Problems in the evaluation of alternative medicine [Clinical Trial. Journal Article. Review. Review, Academic.] Social Science and Medicine. 1987; 25(6):

669-678; ISSN: 0277-9536.
Note: Refereed Serial.
UI 8807080 5.

<RIVAL SETS> Scientific medicine is based on the biochemical aetiological (sic) model; . . . . Concepts of alternative medicine are often much at odds with conventional scientific notions of materialist causality. So much so that they are clearly no longer part of the same framework of theories and assumptions labelled by Kuhn . . as the scientific paradigm.<end> . . . .
<RESISTANCE> Resistance to information that directly contradicts conventional wisdom is generally high. It may be useful to recall, in this context, that as recently as 1919 it was <quote> "(not) unusual for well-known physicians to get up and leave when medical papers were being read which emphasized the germ theory of disease" <end quote; Kao and Kao (1979)>
<PARADIGMS> Alternative medicine may or may not provide useful inputs to the evolution of the currently accepted medical world view. It is nevertheless only rational to hope that, over the next 100 years, the medical paradigm itself (as distinct from individual techniques and procedures) will evolve as much as it has over the last century.<end>
<QUESTIONS FOUNDATIONS OF PARADIGMS>
<PARADIGM SHIFT> Drugs used by these traditional medical systems that were found to be effective have readily been adopted by SM, <=scientific medicine> without any perceived need to adopt associated theoretical, causal, or mythological models. Adoption of the techniques of acupuncture, homeopathy and some other branches of AM <=alternative medicine> would, in contrast, require changes in the conventional world view, or paradigm of SM.<end> . . . .
<CRUCIAL TESTS> Definitive and widely accepted proof that acupuncture channels have physical, biochemical, or electrical existence would, no doubt, go a long way towards justifying the therapeutic use of acupuncture.<end> . . . . <EVALUATION USING RIVAL ASSUMPTIONS> Traditional acupuncture (TA) . . usually refers to treatment based on the traditional (Chinese) understanding of disease. That is something rarely found in evaluations. . . . When, in addition, the points treated are not varied according to the changing needs of the patient, the procedure could be called formula acupuncture (FA). Most scientific evaluations of acupuncture use this last type of treatment.<end>
<META-ANALYSIS TABLE>
<PUBLICATION BIAS> The assumption underlying this test <=*Lancet* editorial> that there is no `publication bias' on the part of the editors in favour of studies reporting statistically significant results favouring acupuncture over placebo.<end> . . . . <PUBLICATION> Unlike the literature treating RCTs <=randomized controlled trials> for chronic pain, the majority of these evaluations have been published either in China, in conference reports, or journals such as the `Chinese Medical Journal', or in Acupuncture Journals such as the `American Journal of Chinese Medicine', or `Acupuncture & Electro-Therapeutic Research'. . . . These results were obtained by different research teams in a wide range of hospitals in China, and are representative of the types of results presented individually in other publications. . . Scientific progress is plagued by artifactual and misleading results, even at times by <FRAUD> falsification of findings. Nevertheless, the number of cases studied does provide some indication of the presence of a phenomenon that requires further investigation.<end> . . . . <DEBATE> If these results <=findings on acupuncture> are due to hypnotism, then hypnotism mediated by acupuncture would seem a useful treatment. If the effect is deemed similar to placebo, then it would seem that expensive drugs are being used unnecessarily. If these results are fraudulous, then this treatment - which must have caused a good deal of unnecessary suffering to quite a substantial number of surgical cases - should clearly take its rightful place in the annals of the history of science as the foremost medical hoax of this century!<end> <PARADIGM SHIFT> Homeopathy and acupuncture may pose paradigmatic threats to medical science.<end> . . . . <RESEARCH> Nevertheless, it would seem that quantity of evidence on these subjects is increasing. Even if it is poor in terms of quality, it is interesting in terms of its cumulative frequency.<end> . . . .
<PUBLIC DEMAND> It would also seem an appropriate response by the scientific community to a growing public utilization of, and presumably satisfaction with, alternative medicine.<end>

81. Trawick, Margaret (Hobart and William Smith College, Geneva, NY). The Ayurvedic physician as scientist [Journal Article.] Social Science and Medicine. 1987; 24(12): 1031-1050; ISSN: 0277-9536.
Note: Refereed Serial.
Philosophy, Medical.
UI 87319759.

<PARADIGM SHIFTS; PURPOSE> In this paper, I would like to take as my starting point one of the predictions that has been made of both science and culture, namely, that creative, productive scientific or cultural thought takes place on the boundary of a paradigm, at the frontier on which that paradigm loses its authority. . . One implication of this idea, whether mildly or strongly stated, is that people who somehow stand on the border can be expected to be more creative than others, to be more objective than others, to have clearer vision. . . . . Does the creative boundary of modern world civilization lie on the frontier of the future, on the cutting edge of scientific research, or does it lie on the periphery of centralized authority, among the fissures of the decaying empires of the past? . . . . Who are the people better able to understand what is going on around them, those who broach no challenge to their authority or to the ideology supporting it, or those whose authority and ideology are constantly challenged from outside and from above?<end>
<DETAILED DESCRIPTION OF THE COSMOLOGY EMBEDDED IN AYURVEDA>
<RIDICULE> . . . the total lack of accord between Ayurvedic and western medical texts, and the contempt in which the western physician <=of the early to mid-20th c.> held native medicine, expressed in the domain of healing and wider conflict between British and Hindu ways of life.<end>
<TRANSCRIPTION OF PATIENT-PHYSICIAN INTERACTIONS>
<SCIENCE AS ATHEISTIC> . . . modern biomedical writers make no *explicit* reference to God in their explanatory theories, and consider teleological paradigms such as vitalism to be outmoded. . . <end>

82. Unschuld, Paul U. (Institute for the History of Medicine, University of Munich, Germany). Traditional Chinese medicine: Some historical and epistemological reflections [Historical Article. Journal Article.] Social Science and Medicine. 1987; 24(12): 1023-1029; ISSN: 0277-9536.
Note: Refereed Serial.
Philosophy, Medical.
UI 87319758.

<REDUCTION OF CHINESE MODEL> Throughout the U.S.A. and western Europe, a so-called Chinese medicine is practised and finds a clientele of patients. Mostly, though, this `Chinese medicine' is limited to acupuncture and to certain notions of health, illness, and suitable therapeutic intervention that, often enough, appear to mirror western ideals of what an `alternative' medicine should be like rather than original Chinese thought.<end> . . . .
<LITERATURE> Obviously, the times are gone when a single footnote appeared sufficient to some western authors for a short characterisation of the basic tenets of traditional Chinese medicine.<end> . . . . <ORIENTALISM?> Most authors turn their eyes to the Far East to uncover an alternative to a western medicine that they can perceive only in rather critical terms. However, in searching for an east Asian alternative, the basic values of western civilisation are applied again to select from a heterogeneous bundle of concepts and practices those that appear - even as an `alternative' - plausible to a western audience.<end>
<DEFINITIONS>
<INTEGRATION; DEBATE BETWEEN FUNCTIONALISTS AND CONSTITUTIONALISTS> With its notions of internal imbalances or disharmonies as pre-conditions of any pathogenic activities, inside the organism, of external intruders (be it worms, wind, or humidity, among others) the traditional Chinese functional-individualistic approach finds a parallel in modern western medical history too, namely, in the arguments raised, beginning with the late 19th century

and continuing until the very present, by the so-called constitutionists who opposed the claims of radical bacteriology that disease is caused by germs, bacteria, or other such external agents. The constitutionalists held - and their arguments have been strengthened by immunology and psychology alike in recent years - that something must be wrong internally before an external agent may cause problems within an organism. . . <end> . . . . <FAILURE> An ontological approach, in China as in Europe, tends to neglect the individual patient because it focusses on a fight against the disease or against the pathogenic agent, rather than on restoring a function or system of functions.<end> . . . . <LITERATURE> First, until very recently, European and American scholars in Chinese studies have left the realm of Chinese health care and medicine virtually untouched. This is all the more surprising if one realises that it should be regarded as most valuable for an understanding of a foreign culture to analyse how this foreign culture has dealt with such existential issues as are human illness and early death. As a result of this neglect, only <LANGUAGE BARRIER> very few serious translations and analyses of ancient Chinese medical texts are available, while a large number of books written by authors with no special knowledge of Chinese language or philosophy reflect what can be learned from secondary literature, from attending short-term training courses in acupuncture and its theoretical background, and from limited periods of actual field work in China. Second, one of the major problems marking studies of traditional Chinese concepts of health care in the west is a lack of familiarity with our own European/western traditions. Researchers - no matter whether they approach Chinese medicine from a perspective of medical anthropology, sociology, history, or philosophy - should be aware of the risks emerging form a situation where authors, after spending considerable time and many efforts on getting access to Chinese medicine, are unable to match their knowledge on the conceptual development and background of traditional European and modern western medicine. . . . From an initial assumption of a black and white contradistinction of western versus a Chinese medicine, we now slowly come to appreciate the fact that no such clear-cut contrast exists. . . . Modern western medicine did not enter China as a fundamentally alien set of concepts and practices; when it met traditional Chinese medicine it was confronted with much of its own past.<end>

83. Kyerematen, G. A.; Ogunlana, E. O. (Department of Pharmacognosy, University of Uppsala Biomedical Center, Uppsala, Sweden). An integrated approach to the pharmacological evaluation of traditional materia medica [Journal Article. Review. Review, Tutorial.] Journal of Ethnopharmacology. August 1987; 20(3): 191-207; ISSN: 0378-8741.
Note: Refereed Serial; Abstract presented at the Commonwealth Science Council's Workshop/Seminar on Medicinal and Aromatic Plants, Harare, Zimbabwe, June 1985.
Models, Biological.
UI 88064309.

<INTEGRATION> The World Health Organization has acknowledged that its target of providing total health coverage for everybody by the year 2000 can only be met by incorporating traditional medical practices into the overall health delivery schemes of developing countries (WHO Report, 1978). The development/application of scientific methodology to validate the medicinal and document the toxicological properties of traditional drugs has been stressed as an important requirement for improving the quality of traditional medical practices. . . The very real potential for discovering new drugs from medicinal plants provides additional motivation for the pharmacological evaluation of traditional materia medica . . <end> . . . . <RESEARCH STAGES> Classical approaches to the pharmacological evaluation of naturally derived drugs have largely involved primary screening of the crude drug extract while reserving more specific biological tests for the pure chemical entities eventually isolated from these extracts.<end> . . . . <NO COMMUNICATION> Serious communication between traditional doctors and scientific investigators has been strongly advocated as fundamental for setting up a successful traditional medicine research program . . In past situations, however, there has been little to no interaction between traditional practitioners and scientists. . . . . It may be noted here that in developing countries, the level of pharmacological expertise among natural product researchers is much lower

than in the chemical areas.<end>

84. Omura, Yoshiaki M.D., Sc.D., F.A.C.A., F.I.C.A.E. (Founder and Editor-in-Chief, *Acupuncture and Electro-Therapeutics Research, The International Journal*; Director of Medical Research, Heart Disease Research Foundation, New York; Adjunct Professor of Pharmacology, Chicago Medical School; Visiting Research Professor, Department of Electrical Engineering, Manhattan College, Attending Physician, Neuroscience Department and New York Pain Center, Long Island College Hospital; President, International College of Acupuncture and Electro-Therapeutics). On the special occasion of the 40th anniversary of the founding of Pergamon Press: A brief historical background of *Acupuncture and Electro-Therapeutics Research, The International Journal* [Historical Article. Journal Article.] Acupuncture and Electro-Therapeutics Research, The International Journal. 1988; 13(1): 1-8; ISSN: 0360-1293.
Note: Refereed Serial; International College of Acupuncture and Electro-Therapeutics.
Located serendipitously.
UI 88249933.

<CRUCIAL TESTS> The fact that this surgery <=May 1972 skin graft performed by Dr. G. Ephron and Dr. Omura in New York City> was performed at University Hospital under the close scrutiny of faculty members of the medical school helped to stimulate research and interest in acupuncture at medical schools in the USA and abroad.<end> . . . . <FIRST FULL-TIME RESEARCH POSITION> As far as we know, in 1972 the foundation <=Heart Disease Research Foundation> was the first organization to support research on acupuncture in the United States.<end> . . . . <NEW JOURNAL; NEW ORGANIZATION> Our journal soon became the official journal of the International College of Acupuncture & Electro-Therapeutics, an organization permanently chartered by the University of the State of New York. . . . . indexed in fifteen major international indexing periodicals, was generally regarded as the most important international scientific journal in the field.<end>
<NEW SOCIETY - December 1986 - American Society of Acupuncture>
<FIRST DOCUMENTED CLINICAL REPORT - June 30, 1825>
<QUACKERY> Until recently, there has been no law regulating acupuncture or electro-therapeutics (although in the early 1900's, the A.M.A. denounced electro-therapy as "quackery" due to its misuses by many individuals without proper medical training.<end> . . . .
<CURRICULUM> International College of Acupuncture and Electro-Therapeutics was the first organization under the new regulations <=January 1, 1988 course accreditation requirements> to be authorized by the New York State Boards for Medicine and Dentistry to give accredited courses in acupuncture in the U.S.A. . . . . In Finland, acupuncture is a part of the required medical curriculum.<end> . . . . <INTEGRATION> As we move into the twenty-first century, medical practice and research should take advantage of the best of Oriental and Western medicine, in order to meet the unique needs of the individual.<end>

85. Friedman, Mark J., Ph.D. (Associate Professor, Department of Mathematical Sciences, University of Alabama, Huntsville, AL); Birch, Stephen, Lic. Ac., B.A. (Faculty and Research Director, New England School of Acupuncture, Watertown, MA); Tiller, William A., Ph.D. (Professor, Department of Material Science and Engineering, Stanford University). Towards the development of a mathematical model for acupuncture meridians [Journal Article. Review. Review Tutorial.] Acupuncture and Electro-Therapeutics Research, The International Journal. 1989; 14(3-4): 217-226; ISSN: 0360-1293.
Note: Refereed Serial; International College of Acupuncture and Electro-Therapeutics.
Models, Theoretical.
UI 90177780.

<THEORY> There have been considerable problems in the accurate presentation of traditional concepts from acupuncture and Chinese medicine. It is only recently that appropriate philological and scholarly standards have begun to appear (see Unschuld . .)<end> . . . . <BRIDGE> To our

knowledge, this is the first attempt to build such a bridge. <link between mathematical language and theoretical concepts> . . . . <UNDERLYING ASSUMPTIONS> . . . we assume an interpretation of "disease" as a phenomena closely associated with a blockage in a meridian, <MERIDIAN SYSTEM> and assume that treatment initiates the unblocking process.<end>

86. Jagirdar, Pankaj C., M.D. (Satya Darsan Society, Bombay, India). The theory of five elements in acupuncture [Historical Article. Journal Article]. American Journal of Chinese Medicine. 1989; 17(3-4): 135-138; ISSN: 0192-415X.
Note: Philosophy, Medical; Institute for Advanced Research in Asian Science and Medicine.
UI 90224875.

<HISTORICAL BACKGROUND>
<VISUAL MODEL>

87. Omura, Yoshiaki M.D., Sc.D., F.A.C.A., F.I.C.A.E. (Director of Medical Research, Heart Disease Research Foundation, New York; Adjunct Professor of Pharmacology, Chicago Medical School; Visiting Research Professor, Department of Electrical Engineering, Manhattan College; Adjunct Professor, Department of Physiology, School of Medicine, Showa University, Tokyo, Japan; President, International College of Acupuncture and Electro-Therapeutics); Lin, Tsung-Lang, M.A. (Qi-Gong Master Lin Tao, Taiwan, Guest of the U.N. Staff Qi Gong Research Group; Behaviour Medicine & Biofeedback Laboratory, Department of Psychology, Brooklyn College, City University of New York; Qi Gong Bio-energy Research Center, Bayside Queens ,. NY); Debreceni, Lazslo M.D., F.I.C.A.E. (Director of Clinical Laboratory, Mohacs Hospital, Mohacs, Hungary); Losco, Brother Michael M.S., F.I.C.A.E. (Assistant Professor Department of Electrical Engineering, Manhattan College, Bronx, NY; Bio-Medical Engineer and Electro-Therapy Specialist, Heart Disease Research Foundation); Freed, Simon Ph.D., F.I.C.A.E. (Senior Scientist, Heart Disease Research Foundation; Senior Scientist, Department of Chemistry, Brookhaven National Laboratories); Muteki, Takesuke M.D., Ph.D., F.I.C.A.E. (Professor and Chairman, Department of Anesthesiology & Center for Critical Medicine, Kurume University School of Medicine, Kurume, Fukuoka-ken, Japan); Lin, Ching Huang M.A. (U.N. Staff Qi Gong Research Group, NY). Unique changes found on the Qi Gong (Chi Gong) master's and patient's body during Qi Gong treatment: Their relationships to certain meridians <MERIDIAN SYSTEM> & acupuncture points and the re-creation of therapeutic Qi Gong states by children & adults [Journal Article. Review. Review Tutorial.] Acupuncture and Electro-Therapeutics Research, The International Journal. 1989; 14(1): 61-89; ISSN: 0360-1293.
Note: Refereed Serial; International College of Acupuncture and Electro-Therapeutics.
Located when browsing volume - not on original list for sampling.
UI 89300439.

<DEFINITIONS; USE OF CHINESE CHARACTERS IN TEXT; LENGTHY DETAILED HISTORICAL BACKGROUND AND DESCRIPTION; TEXTBOOK STYLE WRITING> <SUCCESSES> Qi Gong has attracted considerable interest among medical professionals in recent years because of some of the measurable objective improvements which often resulted from the treatment.<end> . . . . <PUBLICATION> Many books on Qi Gong have recently been published in both Chinese and Japanese and some in English.<end> . . . . <INITIAL FINDINGS> Before the work was published, <=Omura 1986> nobody knew which internal organ corresponded to the Triple Burner meridian or pericardium meridian <MERIDIAN SYSTEM>. . . <end> . . . . <CURIOSITY> However, because of Dr. Worley's scientific curiosity about Qi Gong, he asked the first author to give this woman Qi Gong treatment.<end> . . . . <CHEMICAL FINDINGS> Our previous study indicated that the presence of Thromboxane B2 is an indication of the presence of circulatory disturbance.<end> . . . . <DISADVANTAGE> . . . it may damage the Qi Gong practitioner's intestinal system around the lower abdomen under the umbilicus (known as Dan Tian) by destroying the bacteria that normally exist there, thus creating some inflammation.<end> . . . <ADVANTAGE> An advantage of Qi Gong over acupuncture is that

while insertion of an acupuncture needle in an infected area may physically spread a viral or bacterial infection, Qi Gong bio-energy is completely non-invasive, so one can treat an infected area with no such concerns of spreading infection.<end>

88. Vrana, J. (Director, Professor, M.D., Dr. Miroslav Vykydal, DrSc., Medical Faculty of the Palacky, Olomouc, Czechoslovakia). A brief account of Far East medicine [Historical Article. Journal Article.] Acta Universitatis Palackianae Olomucensis Facultatis Medicae. 1989; 123: 279-285; ISSN: 0231-5599.
Note: Non-Refereed Serial.
Philosophy.
UI 90164115.

<HISTORICAL BACKGROUND; DEFINITIONS>

89. Bullock, Milton L. (Department of Medicine, Hennepin County Medical Center, University of Minnesota Medical School, MN); Culliton, Patricia D. (Department of Medicine, Hennepin County Medical Center, University of Minnesota Medical School, MN); Olander, Robert T. (Hennepin County Detoxification Center, Minneapolis, MN). Controlled trial of acupuncture for severe recidivist alcoholism [Clinical Trial. Journal Article.] The Lancet. June 24, 1989; 1(8652): 1435-1439; ISSN: 0023-7507.
Note: Refereed Serial.
UI 89280933.

<BACKGROUND> <caps> FOR <end> centuries, acupuncture has been used in Far Eastern countries for various human ailments. . Only lately, however, has acupuncture been used to treat addictive disorders. Chinese textbooks on acupuncture, . . do not refer to addictive drugs or to the treatment of addictive disorders, but the suggestion that acupuncture can . . . <end>

90. Patel, Mahesh (Versoix, Switzerland); Gutzwiller, Felix; Marazzi, Alfio (Institut Universitaire de Médicine Sociale et Préventive, Lausanne, Switzerland). A META-analysis of acupuncture for chronic pain [Clinical Trial. Journal Article. Randomized Controlled Trial.] International Journal of Epidemiology. December 1989; 18(4): 900-906; ISSN: 0300-5771.
Note: Non-Refereed Serial; International Epidemiological Association.
UI 90153032.

<PUBLIC INTEREST; ECONOMICS FACTORS=INSURANCE REIMBURSEMENT; CRUCIAL TESTS> While acupuncture is increasingly used by the general public and treatment costs are often reimbursed by health insurance companies, its clinical efficacy remains scientifically unproven. . <end> . . . . <METHODOLOGY> This MA <=meta-analysis> is based on results of all trials of acupuncture for treatment of chronic pain, published in English, listed in Index Medicus from 1970 onwards that were randomized controlled trials (RCTs) of chronic pain that measured outcome in terms of numbers of patients whose condition improved.<end>

91. Foster, James H. M.D. (Department of Surgery, University of Connecticut Health Center, Farmington, CT). Some Eastern thoughts for northeastern surgeons: Presidential Address to the 70th Annual Meeting of the New England Surgical Society, Bretton Woods, NH, September 22 to September 24, 1989 [Journal Article.] Archives of Surgery. June 1990; 125(6): 702-706; ISSN: 0004-0010.
Note: Refereed Serial; American Medical Association.
Philosophy, Medical.
UI 90267207.

I have no valid credentials for talking about Eastern values. I have spent a total of slightly less than 4 months on four different trips to the Orient, and much of that time was in the

countryside.<end> . . . . <TECHNOLOGY> . . . our excessive dependence on the lesser god of Technology and Chi-square Analysis has brought medicine to a complexity that hovers on the brink of absurdity.<end> . . . . <DISSATISFACTION; PEER REVIEW; EVALUATION> I do not even bother any more to learn the latest "scientific truths" about the treatment of breast carcinoma, first, because my aged memory is fading, and second, because I know there will be a different recommendation in 6 months. . . Well-meaning but misguided people, who were probably toilet-trained at too early an age, have come to believe that you can measure the quality of patient care with a yardstick marked out in reproducible units that can be applied by clerks . . . One can only hope that this peer review process will pass through its "anal" phase quickly and move on to something more constructive. Today we even grade resident's performances by numbers to make the process more "scientific". . . <JOURNALS> Much of this balderdash evolves from a computer mentality that can only look at quantifiable material. . . . As our scientific journals multiply, their usefulness diminishes. Anything with data is published. . . . The academician gets his kicks from successful experiments, grants funded, and papers published. He looks down on the unscientific nature of most medical practice. The practitioner, in turn, derides the scientist for his ineptness at the bedside. Both parties feed this conflict with their insecurities because our Western ethic says that the medical scientist ought to be an effective doctor and that the practitioner ought to be a scientist. . . . The Westerner does not deal comfortably with paradox. . . . Much of this balderdash evolves from a computer mentality that can only look at quantifiable material. . . . The modern Western view of society and politics is economic, legalistic, and mathematical - materialistic, if you will. Medicine is becoming increasingly misshapen in the same direction, but medicine is not, should not, must not be a profession based on economic or legal values. . . . The travelling Westerner (and that includes most Japanese) sees the world through the aperture of his camera, fixing and measuring it for the permanent record so that he and his wife can argue over whether that building was the Temple of Heavenly Bliss or the Palace of Eternal Enchantment the next time they show their slides.

92. Thorén, Peter; Floras, John S.; Hoffmann, Pavel; Seals, Douglas R. (Department of Physiology, University of Gôteborg, Gôteborg, Sweden). Endorphins and exercise: Physiological mechanisms and clinical implications [Journal Article. Review. Review Tutorial.] Medicine and Science in SPorts and Exercise. August 1990; 22(4): 417-428; ISSN: 0195-9131.
   Note: Refereed Serial; American College of Sports Medicine.
   Models, Biological.
   UI 90384345.

   <TECHNICAL DESCRIPTION>
   <UNDERLYING ASSUMPTIONS> Why suggest that similar mechanisms may be involved in mediating analgesic effects of acupuncture and prolonged exercise? Detailed studies . . . <end>

93. Brockhaus, A.; Elger, C. E. (Universitäs-Nervenklinik, Epileptologie, Bonn, Germany). Hypalgesic efficacy of acupuncture on experimental pain in man: Comparison of laser acupuncture and needle acupuncture [Clinical Trial. Journal Article. Randomized Controlled Trial.] Pain. November 1990; 43(2): 181-185; ISSN: 0304-3959.
   Note: Refereed Serial.
   UI 91204303.

   <NO DEFINITIONS; NO HISTORICAL BACKGROUND; PURPOSE> Acupuncture is used worldwide for the treatment of acute and chronic pain . . , and yet there are only a few experimental studies under controlled conditions, which prove the analgesic efficacy of acupuncture. In particular the efficacy of laser acupuncture . . . <end>

94. Rakovic, Degan, Ph.D. (Associate Professor, Faculty of Electrical Engineering, University of Belgrade, Belgrade, Yugoslavia). Neural networks, brainwaves, and ionic structures: Acupuncture vs. altered states of consciousness [Journal Article]. Acupuncture and Electro-Therapeutics

Research, The International Journal. 1991; 16(3-4): 89-99; ISSN: 0360-1293.
Note: Refereed Serial; International College of Acupuncture and Electro-Therapeutics.
Models, Biological.
UI 92133395.

<NO DEFINITIONS; NO HISTORICAL BACKGROUND; HIGHLY TECHNICAL LANGUAGE; MATHEMATICAL AND ELECTROENGINEERING VISUAL MODELS; EQUATIONS; READER MUST HAVE EXTENSIVE BACKGROUND TO DECODE; CANNOT BE READ WITHOUT SPECIALIZED LITERACY LEVEL>

95. Goldman, Brian, M.D. (Toronto Emergency Physician). Ayurvedism: Eastern medicine moves West [Journal Article.] CMAJ: Canadian Medical Association Journal. January 15, 1991; 144(2): 218-221; ISSN: 0008-4409.
Note: Refereed Serial; Canadian Medical Association.
UI 91098551.

<DISSATISFACTION> Modern health care poses a conundrum. Researchers of medicine are pushing the frontiers of medicine ever outward, surgeons are transplanting organs and geneticists are mapping the human genome with increasing precision, yet scientific medicine is being met by waves of discontent.<end> . . . . <RIDICULE> Others <=opponents> say it <=Ayurveda> is little more than a marketing ploy designed to cater to the neuroses of the affluently ill.<end>
<QUOTES DEEPAK CHOPRA>
<THEORETICAL MODEL> "The more we understand the mechanics of perception, the clearer it becomes that our current model of the human body, perhaps, is based on a superstition, even though we call it the `scientific' model."
<HISTORICAL BACKGROUND>
<TRAINING> In Canada, ayurvedic medicine is taught by the Canadian Association of Ayur-Vedic Medicine, which says more than 1200 North American physicians have received training. There are already three ayurvedic health centres in Canada - in Montreal, Ottawa and Huntsville, Ont.<end>

<COMMENTS: Vol. 145(1)> In general, Dr. Brian Goldman's articles . . . convey a fair sense of the theoretical framework of Maharishi Ayur-Veda . . . However, ... Dr. William Jarvis . . . dismisses ayurvedic medicine as being pre-scientific and asserts that causality in Ayur-Veda is attributed to supernatural influences.<end> . . . . <GOLDMAN RESPONDS> . . . he seems to regard the term "prescientific" as a slur, whereas it is merely descriptive.<end>
<EXAMPLE OF DEBATE IN THE COMMENTS SECTION>

96. Rogvi-Hansen, B. á. (Department of Internal Medicine and Endocrinology F, Herlev Hospital); Perrild, H. (Department of Internal Medicine and Endocrinology C, Bispebjerg Hospital); Christensen, T. (Department of Internal Medicine and Endocrinology, E. Frederick Hospital, University of Copenhagen, Denmark); Detmar, S. E. (Department of Internal Medicine and Endocrinology, E. Frederick Hosptical, University of Copenhagen, Denmark); Siersbaek-Nielsen, K. (Department of Internal Medicine and Endocrinology, E. Frederick Hosptical, University of Copenhagen, Denmark); Hansen, J. E. M. (Department of Internal Medicine and Endocrinology F, Herlev Hospital). Acupuncture in the treatment of Graves' ophthalmopathy: A blinded randomized study [Clinical Trial. Journal Article. Randomized Controlled Trial.] Acta Endocrinologica. February 1991; 124(2): 143-145; ISSN: 0001-5598.
Note: Refereed Serial.
UI 91165465.

<NO DEFINITIONS; NO HISTORICAL BACKGROUND; HIGHLY TECHNICAL CLINICAL TRIAL>

97. Loi, Dô-Tât; Dung, Nguyén Xuân (Faculties of Pharmacy and Chemistry, University of Hanoi, Hano, Vietnam). Native drugs of Vietnam: Which traditional and scientific approaches? [Journal Article]. Journal of Ethnopharmacology. April 1991; 32(1-3): 51-56; ISSN: 0378-8741.
Note: Refereed Serial.
Philosophy.
UI 91350815.

<DATE> After the August Revolution (1945), traditional medicine in our country <Vietnam> was rehabilitated to its state position.<end> <MOTIVATION> Many people (in our country and elsewhere) often asked Prof. Dr. Dô-Tât Loi "Why do you eagerly return to popular traditional medicinal plants and drugs of this atomic era, when surgery has achieved extraordinary successes like transplantation of some human organs, when antibiotics and synthetics persuade us? Why do you make research concerning traditional medicinal plants and drugs even they are studied all over the world?" . . . . In D.T. Loi's childhood, in a few cases, he himself was cured with popular traditional drugs and he witnessed not a few patients being cured with oriental traditional drugs which may be a single plant or only a simple inexpensive recipe. But when he entered the Faculty of Pharmacy in 1939, he was stunned by the fact that no one spoke of traditional medicinal plants and drugs. If one had spoken of them, one would have spoken <RIDICULE> scornfully. . . . . on the other hand he visited famous native doctors, and patients having been cured by oriental drugs after they had been treated unsuccessfully by occidental drugs.<end> . . . . <ARCHIVAL MATERIALS> First of all, it is necessary to master the experiences of treating diseases and utilization of drugs of antique men by investigating and comparing the documents of many countries, consulting antique and recent documents.<end> <ECONOMICS> Veteran investigators of traditional popular medicine knowing well its complexity, appreciate that it needs time and money for investigation to decide to continue studying and to use the knowledge acquired from the investigation to treat diseases at the same time. <GOVERNMENTAL SUPPORT> The Vietnamese government has advocated this approach since almost all the <OPINION LEADERS> previous and present leaders of Vietnam were cured with traditional medicine during the secret activity period of time. Now those <POWER STRUGGLE> who have high positions in the health service are occidental medical doctors. They carry out this policy reluctantly because of different conception and organization.<end> . . . . <RESEARCH STAGES> If the results are good, we will propagate. If the medicaments are not effective but not harmful they may be given up or not according to the requirement of the traditional medical men and the patients. . . . . We must say that many traditional herbal remedies are effective, even though it is not possible yet to establish this by chemical, toxicological, pharmacological and clinical work. Medicinal herbs have two properties: therapeutic and occult. Most literature reports results of investigations of the therapeutic aspect of herbs only. . . . . But it is not so easy to find a good team of scientists in the developing countries and even in the industrial countries for this research. . . . Traditional medicine should be introduced to people in general and especially to students and young scientists.<end> . . . .
<LISTS BENEFITS>
<FAILURE> . . . it is beyond doubt that modern medicine has achieved a great number of successes but has had and will have its own failures and limitations.<end> . . . .
<INTEGRATION> But a preliminary requirement for this integration is the presence of a new kind of medical scientist who can serve as mediator between modern medicine and traditional medicine . . <end>

98. Burkett, Gary L., Ph.D. (Department of Family Medicine, East Tennessee State University). Culture, illness, and the biopsychosocial model [Journal Article. Review. Review Tutorial.] Family Medicine. May-June 1991; 23(4): 287-291; ISSN: 0742-3225.
Note: Non-Refereed Serial.
Models, Theoretical.
UI 91293451.

<PATERNALISM> There is a danger in cross-cultural medicine of a not-quite-verbalized but nonetheless paternalistic assumption that if only we (members of the dominant culture) can understand people from other cultures a little better, we can be more successful in getting them to do what we know is best for them.<end> . . . . <RIVAL SETS> While other healing systems are viewed as culturally determined manifestations of "ethnomedicine," it is easy to ignore the historical and cultural roots of the dominant healing system in Western industrial societies. <quote> "Although biomedicine both constitutes and is constituted by society, this interdependency is nonetheless denied by biomedical theory and ideology which claim neutrality and universality." . . <end quote; D. Gordon (1988) Tenacious assumptions in western medicine. In M. Lock & D. Gordon, (eds.) *Biomedicine examined.*> . . . . <UNIVERSAL PARADIGM SHIFT - see SCHWARTZ AND OGILVY> We are living in an age in which appreciation for the unity of body and spirit is being regained. . . . There are growing movements and a burgeoning body of literature linking the health of one's body to the state of one's mind.<end> . . . . <QUOTES ENGEL (1987)> "Medicine's scientific model continues to restrict the scientific domain to that which can be approached by virtue of its Cartesian dualism. Hence the paradox that what is most central to the field of medicine, namely the study and understanding of human beings who are or who believe themselves to be sick, is perforce largely excluded from the domain of science." . . <end quote>

99. Goldman, Brian, M.D. (Toronto Emergency Physician). Chronic pain and the search for alternative treatments [Journal Article]. <u>CMAJ</u>: <u>Canadian Medical Association Journal</u>. September 1, 1991; 145(5): 508-509, 512-513; ISSN: 0008-4409.
Note: Refereed Serial; Canadian Medical Association.
UI 91347185.

<FAILURE OF BIOMEDICINE> Although conventional treatments, from orthopedic surgery to neurosurgery and psychotherapy, do have roles to play in treating chronic pain, none is a panacea. This is causing a growing number of physicians to seek alternative methods of treatments.<end> <QUACKERY> "Alternative therapy" is, of course, a medical cussword. To some doctors it means potentially useful but untested; to others, quackery.<end> . . . . <DEBATE> He <=Dr. Bruce Pomeranz, a neurophysiologist at the University of Toronto> says electroacupuncture produces its best results in patients with osteoarthritis . . . . <quote> "There doesn't seem to be any pains that aren't helped," . . . <end quote> Dr. John Loeser disagrees. <quote> "I think it's a relatively innocuous treatment with low health hazards that lacks any kind of scientific validity whatsoever," the director of the Multidisciplinary Pain Center at the University of Washington in Seattle . . . " . . . . <SKEPTICISM> Pomeranz says many studies are being ignored by the sceptics.<end> . . . . <quote> " . . . we don't know how gaseous anesthetics work but we use them all the time because empirically they work."<end quote><end> <DEBATE> As the acupuncture debate continues, an east-west meeting of the minds is taking place at the Gunn Pain Clinic in Vancouver.<end> . . . . <SUCCESS; MOTIVATION> <quote> Dr. Chit-Chan Gunn "When I did an EMG <=electromyography> examination followed by stimulation through the needle, the man came to me the next day and said that his pain was completely gone and he was returning to work. Incidents like that convinced me this was a technique worth studying."<end quote><end> . . . . <RECONCILIATION> The theory <=Gunn's belief that many patients with chronic pain have tender, shortened muscles because of an occult neuropathy of the segmental nerves that supply the affected skeletal muscles> is consistent with Cannon's Law, a long-forgotten rule of physiology that states a neuropathy causes end organs - in this case, the muscles - to become more sensitive or tender.<end> . . . . <DISSEMINATION; PERSONAL RECOGNITION> Gunn has been asked to teach IMS <=intramuscular stimulation> to physicians in more than a dozen countries, and is just beginning to gain recognition from North American doctors.<end> . . . . <INTERNAL FACTORS> If today's doctors are to get a handle on chronic pain, they will probably have to develop novel theories like the one proposed by Gunn. However, that means more research is needed, and there simply aren't many researchers interested in this field. It's not a popular subject like heart disease and cancer, even though chronic pain causes

more disability than cancer and heart disease combined.<end> . . . . <INTERNAL; COMPLEXITY> . . . Ronald Melzack, PhD, a McGill University researcher, ... <quote> Almost all the research goes on at the level of the spinal code, or maybe as high up as the brainstem, but above that lies a thalamus and a great big complicated cortex. We have got to start understanding that part of the brain, yet many people shy from it because it is such a complex problem."<end quote><end>

100. Wang, W. K. (Biophysics Laboratory, Institute of Physics, Academia Sinica, Nankang, Taipei, Taiwan); Wang, Y. Y. Lin (Department of Physics, National Taiwan University, Taiwan). Biomedical engineering basis of traditional Chinese medicine [Journal Article]. Medical Progress Through Technology. 1992; 18(3): 191-197; ISSN: 0047-6552.
Note: Refereed Serial.
Models, Cardiovascular.
UI 93133164.

<HIGHLY TECHNICAL; DEFINITIONS; MATHEMATICAL MODELLING; FULL INTEGRATION OF SCIENTIFIC THEORIES AND CHINESE MEDICAL THEORIES>

101. Tavola, Tiziana; Gala, Costanzo; Conte, Giovanni; Invernizzi, Giordano (Headache Center, Department of Psychiatry, University of Milan, Milan, Italy). Traditional Chinese acupuncture in tension-type headache: A controlled study [Clinical Trial. Journal Article. Randomized Controlled Trial.] Pain. March 1992; 48(3): 325-329; ISSN: 0304-3959.
Note: Refereed Serial.
UI 92278784.

<LITERATURE> Over the last decade, several studies have investigated the efficacy of acupuncture in relieving headache pain . . . <end> <TECHNICAL WRITING; STRICT CLINICAL TRIAL FORMAT> <RIVAL SETS> In classical 'Western' acupuncture standardized points are chosen a priori, while the traditional Chinese system involves the utilization of points which differ from patient to patient with the possibility of varying them in subsequent sessions.<end>

102. Thomas, L. Eugene (Human Development, University of Connecticut, Storrs, CT). Identity, ideology and medicine: Health attitudes and behavior among Hindu religious renunciates [Journal Article]. Social Science and Medicine. March 1992; 34(5): 499-505; ISSN: 0277-9536.
Note: Refereed Serial.
Philosophy.
UI 92294915.

<LITERATURE> Despite a sizeable literature on the relation of religion to health attitudes and practices, the findings have been on the whole inconclusive. . . . Almost entirely missing in the literature is discussion of the existential meaning that religion has for the individual. In particular, the extent to which religious beliefs inform a person's overall world-view such that it influences his or her health attitudes and medical behavior, has not been explored. . . . . there is tension between an individual's world-view and assumptions underlying a particular medical system . . . <end> . . . . <INTEGRATION> Yet, allopathic medicine is seen by most Indians as being superior to Ayurvedic medicine . . , and Ayurvedic practitioners often utilize allopathic treatment when they or members of their family are sick . . <end> . . . . <WESTERN INFLUENCE> It was only under the influence of the West that the practice of medical intervention by religious renunciates was adopted. . <end> . . . . <FAILURE> As indicated above, modern society has eroded belief in this sacred tradition . . and increasing disability and disease serve as a personal reminder of the fact of aging.<end>

103. Sheehan, M. P., MRCPI (Department of Dermatology, Royal Free Hospital and School of

Medicine); Rustin, M. H. A., MRCP (Department of Dermatology, Royal Free Hospital and School of Medicine); Atherton, D. J., FRCP (Department of Dermatology, Hospital for Sick Children, London); Buckley, C., MRCP (Department of Dermatology, Royal Free Hospital and School of Medicine); Harris, D. W. S., MRCP (Department of Dermatology, Royal Free Hospital and School of Medicine); Brostoff, J., FRCP (Department of Immunology, University College and Middesex School of Medicine, London, England); Osteler, L., MRCP (Department of Dermatology, Royal Free Hospital and School of Medicine); Dawson, A., MA (Department of Dermatology, Royal Free Hospital and School of Medicine). Efficacy of traditional Chinese herbal therapy in adult atopic dermatitis [Clinical Trial. Journal Article. Randomized Controlled Trial.] Lancet. July 4, 1992; 340(8810): 13-17; ISSN: 0023-7507.
Note: Refereed Serial.
UI 92301181.

<RESEARCH INTEREST> There has been considerable interest in traditional Chinese herbal therapy (TCHT) as a new treatment for atopic dermatitis.<end> . . . . <RIVAL SETS> A serious difficulty of assessing traditional Chinese herbal therapy (TCHT) scientifically is that normally each patient is prescribed an individualised prescription, based upon an evaluation of the nature of the pulse and appearance of the tongue as well as features of the disease itself.<end>
<VISUAL MODEL>

<CORRECTION PRINTED IN LATER ISSUE: AUTHOR'S INITIALS>

104. Madan, T. N. (Institute of Economic Growth, Delhi, India). Dying with dignity [Journal Article. Review. Review Tutorial.] Social Science and Medicine. August 1992; 35(4): 425-432; ISSN: 0277-9536.
Note: Refereed Serial.
Philosophy, Medical.
UI 92390755.

<CRITICISM OF BIOMEDICINE> . . . the notion of death as separation, as a catastrophe, and as sorrow. . . . `medicalization' of death as a result of which it came to be denied. Death became a shameful thing, an embarrassment, even dirty and indecent. . . . In short, death loses contact with human dignity. . . . . we act as if it did not exist, and thus mercilessly force the bereaved to say nothing . . . invasion of human life by technology . . . . Modern notions of institutionalized care of the ageing and dying, the phenomena of the old-age home and the hospital, on which modern society prides itself, initiate a process of isolation of those who are still alive and even healthy at their age . . , or dying but not unaware of their condition and of the reaction of normal people around them.<end>

105. Ho, Gloria Y. F. (Department of Epidemiology, School of Hygiene and Public Health, The Johns Hopkins University, Baltimore, MD); Nelson, Kenrad (Department of Epidemiology, School of Hygiene and Public Health, The Johns Hopkins University, Baltimore, MD); Nomura, Abraham M. Y. (Kuakini Medical Center, Honolulu, HI); Polk, B. Frank (Department of Epidemiology, School of Hygiene and Public Health, The Johns Hopkins University, Baltimore, MD); Blattner, William A. (Environmental Epidemiology Branch, National Cancer Institute, Bethesda, MD). Markers of health status in an HTLV-I positive cohort [Journal Article]. American Journal of Epidemiology. December 1, 1992; 136(11): 1349-1357; ISSN: 0002-9262.
Note: Refereed Serial; Johns Hopkins University School of Hygiene and Public Health.
Chosen as representative of AIDS research.
UI 93142775.

<NO DEFINITIONS; NO BACKGROUND; HIGHLY TECHNICAL RESEARCH REPORT>

106. Nissel, H. M.D., F.I.C.A.E. (Ludwig Boltzmann Acupuncture Institute, Vienna). Pain treatment by

means of acupuncture [Journal Article. Review. Review Tutorial]. Acupuncture and Electro-Therapeutics Research, The International Journal. January-March 1993; 18(1): 1-8; ISSN: 0360-1293.
Note: Refereed Serial; International College of Acupuncture and Electro-Therapeutics.
Models, Biological.
UI 93269664.

<BACKGROUND; ABSTRACT SUMMARY> Acupuncture has played an important part in pain research. Bischko was the first in the Western hemisphere to undertake surgery using acupuncture analgesia. This tonsillectomy was performed in 1972. Decisive research work has been carried out at the Ludwig Boltzmann Acupuncture Institute in Vienna. We now have far more knowledge about the importance of the basic system. Furthermore, we know that the theories on chaos research, and, especially the fractals play an important role.<end>
<HISTORICAL BACKGROUND OF THE INSTITUTE>
<SUMMARY OF FINDINGS>
<DESCRIPTION OF ACUPUNCTURE TECHNIQUES>
<MATHEMATICAL MODELLING>

107. Morton, Alan R.; Fazio, Sam M.; Miller, David (Department of Human Movement Studies, University of Western Australia, Nedlands, Australia). Efficacy of laser-acupuncture in the prevention of exercise-induced asthma [Clinical Trial. Journal Article. Randomized Controlled Trial.] Annals of Allergy. April 1993; 70(4): 295-298; ISSN: 0003-4738.
Note: Refereed Serial; American College of Allergy and Immunology.
UI 93220982.

<LITERATURE; PURPOSE> Despite the increasing popularity of alternative therapeutic techniques for the treatment of common ailments . . there is relatively little research conducted in the area of acupuncture therapy for the alleviation of asthma.<end>
<HIGHLY TECHNICAL CLINICAL TRIAL>

Table 16
Excerpts From Dow Jones Dowquest and Media Reports

DOW JONES:

1. STORY ID: 0000091867WP STYLE PLUS:
Body & Soul --- An Alternative Guide To Good Health
WASHINGTON POST:
STYLE, 01/28/94 Copyright (c) 1994 The Washington Post Co.
By Margaret Mason Special to The Washington Post

Alternative Medicine: The Definitive Guide 1,068 pp., by Burton Goldberg

Mason writes:

> <CONTROVERSY=DEBATE> . . . this is the book -- imperfect and controversial as it may be -- that is needed right now. It is needed, first of all, to get basic information out there, like what to do and where to go, to help sick people start thinking about, and learning, the many ways to access their own healing systems, their own mind/body intelligence, with and without surgery and drugs. It is needed as a starter course for mainstream physicians to learn about alternative medicine.

2. STORY ID: 0000352089ZF
Promoting the merits of alternative medicine.
(Briefings)
PUBLIC RELATIONS JOURNAL, 03/01/93
COPYRIGHT Public Relations Society of America 1993
By Keith Greenberg

Note Greenberg uses the terms "tie-dye and crystal crowd", a highly perjorative label used to ridicule the New Age followers:

> There was a time not too long ago when homeopathy, herbal medicine and touch therapy were considered the domain of the tie-dye and crystal crowd. Regular people, it was believed, went to regular doctors.

cites the Eisenberg et al. study

Quotes Daniel Wolfe, communications coordinator for the Gay Men's Health Crisis, in New York City. The crisis center is "credited with opening the country's minds to new remedies". Wolfe says that "I wouldn't say that people still look at this with a jaundiced eye,". . . "Rather, they're simply looking for answers outside their doctor's office." . . . . "people with AIDS have been shaping the research agenda,". AIDS advocates have organized meetings with and protests against the NIH and Food and Drug Administration, disseminated op-ed pieces, attended forums on drug development, and done extensive local and national lobbying.

3. STORY ID: 0000366994ZF Healing without doctors. (alternative medicine)
AMERICAN DEMOGRAPHICS, 07/01/93
COPYRIGHT American Demographics Inc. 1993
By Susan Mitchell

Mitchell writes:

> "Many doctors refuse to recommend chiropractors, herbal cures, or acupuncture to their patients,

> and some are angrey that such remedies are even allowed. But businesses that deal in alternative medicines have two things some doctors don't: profits and happy customers."

Jeff Hillman, vice president of marketing at Nature's Way, a manufacturer of herbal products based in Springville, Utah is quoted as saying

> People and tired of being blindly led by traditional medical practice. Baby boomers, especially, are independent consumers who are anxious to take more control of their own health.

Tom Rawls, editor of *Natural Health* magazine says:

> If you go to an orthodox physician, the touch will either be with cold instruments or invasive. I think orthodox medicine has lost touch, literally and figuratively.

4. STORY ID: 0000268720DC
   From acupuncture to yoga, alternative healing gains ground
   LOS ANGELES TIMES, 08/22/93
   Copyright The Times Mirror Company; Los Angeles Times. All Rights
   By David R Olmos 1009

First insurance policy of its kind - American Western Life Insurance CO., Foster City, California Mutual of Omaha Insurance Co. will reimburse the costs of non-surgical therapies for heart diseases.

Dr. Oscar Janiger, Associate Clinical Professor of Psychology and Human Behavior, University of California, Irvine's College of Medicine is quoted as saying that doctors will gradually become "more accepting of the complementary role that alternative therapy can play with traditional Western medicine."

5. STORY ID: 0000287350DC
   Alternative medicine gaining popularity
   THE BUSINESS JOURNAL-SACRAMENTO, 11/01/93
   Copyright The Business Journal, Serving Greater Sacramento 1993
   By Raymond Dussault

The National Association Against Health Fraud, according to David Wells, President of the California Acupuncture Committee, states that acupuncture is "quackery" and if acupuncture did work "it would only work when performed by licensed physicians".

6. STORY ID: 0000084913WP
   STYLE PLUS: Body & Soul --- Wellness Powwow
   WASHINGTON POST: STYLE, 11/19/93 Copyright (c) 1993
   The Washington Post Co.
   By Margaret Mason Special to The Washington Post

7. STORY ID: 0000292272DC
   Health conference examines the alternatives
   MISSOULIAN, 11/20/93 Copyright Missoulian 1993
   By Mea Andrews

Dr. Anne Murphy, President of the St. Patrick Hospital Medical staff states that:

> "The major barrier" to the acceptance of alternative therapies "is (lack of) scientific evidence."

8. STORY ID: 0000369061ZF

New support for old therapies. (growing acceptance of alternative medical techniques)
FORBES, 12/20/93

By Richard Phalon

<DISMISSAL> Establishment doctors who dismiss therapies like acupuncture and herbal healing as quackery might benefit from a second opinion on what is happening in the medical marketplace.<end> <PATIENT EMPOWERMENT; QUACKERY> DOES DOCTOR really know best? Not always, it would seem, if you take into account the increasing respectability being won by such nonconventional therapies as acupuncture, biofeedback, chiropractic and herbal medicine. In other cultures these therapies have been standard practice for ages, but most physicians educated in schools approved by the American Medical Association and affiliated with AMA hospitals have long dismissed these techniques as quackery. Today, however, signs of a new approbation for alternative medicine are everywhere<end> . . . . <PATIENT EMPOWERMENT> One of the virtues of alternative medicine, says Mutual's medical director, Kenneth McDonough, is that it gets people involved in helping heal themselves. "It's a form of empowerment," he notes. When you begin to hear buzzwords like "empowerment" in no-nonsense Omaha, you know that change is in the wind.<end> <INTEGRATION> Open-minded professionals like Kenneth McDonough do not envision miracle cures. They simply see alternative medicine as additive to, rather than supplantive of, conventional medicine.<end> <ESTABLISHMENT FEELS THREATENED> If some old-line physicians are feeling crowded, they don't have to look too far for the reasons.<end> . . . . <FAILURE OF BIOMEDICINE> For all its manifest success, American medicine has become outrageously expensive and highly fragmented, with too many specialists focusing on different components of the same anatomy. Nor can conventional medicine cure everybody's ailments. For all these reasons, it should come as no surprise that alternative medicine continues to make inroads.<end>

9. STORY ID: 0000299612DC
   Acupuncture clinic offers new relief to AIDS patients
   THE SEATTLE TIMES, 12/31/93 (991 words)
   THE SEATTLE TIMES, 12/31/93 Copyright Seattle Times Company 1993
   By Helen E Jung

Capital Hill's Kang Wen Clinic, an all-volunteer clinic where "licensed acupuncture practitioners treat people who have acquired immune deficiency syndrome or are HIV-positive", received a $1,300 grant from Ed Miesen, President of the Pride Foundation because the clinic provides relief to AIDS patients where "Western medicine has failed".

10. The Age Before Miracles: Without Antibiotics, Doctors Tried All Sorts of Harebrained Cures. They Also Treated Their Patients as People, Not as Diseases.
    Newsweek
    By Jerry Adler
    March 28, 1994

11. STORY ID: 0000376178ZF
    Acupuncture. (alternative medical treatment) (includes related article)
    CONSUMER REPORTS, 01/01/94
    COPYRIGHT Consumers Union of United States Inc. 1994 010

12. STORY ID: 0000376177ZF Alternative medicine: the facts.
    CONSUMER REPORTS, 01/01/94 COPYRIGHT C
    Consumers Union of United States Inc. 1994 008

Hennepin County Medical Center in Minneapolis has a staff of 14 health practitioners practicing

traditional Chinese medicine. *Consumer Reports* reports that

> Such a meeting of East and West is unusual in American medical circles. But of all the alternative therapies knocking at the door of mainstream medicine, acupuncture may be the first admitted.

Bruce Pomeranz, Professor of Zoology and Physicology at the University of Toronto is quoted as saying that medical researchers know "more about analgesic acupuncture than about the mechanism of action of most anesthetic gases."

Note that most studies conducted in Chna are poorly designed by Western standards.

cites comprehensive review in *Pain* (1986)

Extensive summary of medical research literature and reported outcomes.

Article states that:

> There is also no comprehensive theoretical explanation - in terms of Western medical principles - for acupuncture's apparent effects.

Further down the article reads:

> <USE BUT DON'T UNDERSTAND; ANOMALY = H13> That idea may seem difficult to accept, since so many alternative treatments appear to be philosophically incompatible with medicine as we know it and with one another as well. Yet it may be possible to learn from an alternative treatment without accepting the entire therapeutic system or endorsing the practitioner's explanation for what is going on. When acupuncture works, it may have more to do with the chemicals of the nervous system than with the body's energy flow. Chiropractors may not be fixing spinal "subluxations," as they claim, but may nevertheless have found ways to manipulate the spine that are beneficial for certain types of back pain. And even if homeopathic remedies prove to be placebos (as most doctors believe they will), homeopathy could still provide an opportunity to explore the nature of the placebo effect.

13. STORY ID: 0000304628DC
Alternative health care: Healing with faith
WICHITA BUSINESS JOURNAL, 01/28/94
Copyright Wichita Business Journal Inc 1994
By David Dinell

Richard Harris, Coordinator of "Beat the Odds" at the Center for the Improvement of Human Functioning International is quoted as saying:

> Conventional medical practitioners look upon the center with a certain degree of skepticism, Harris admits, but that's changing with time. "When we first started, we were considered total quacks," . . . "We got that down to half-quack and now we're down to one- quarter quack."

Reports on patients searching for cures.

14. STORY ID: 0000323212DC
The new medicine: Acupuncture, naturopathy and other alternative medicines have made true believers of a surprising number of Twin Citians
MPLS-ST. PAUL MAGAZINE, 05/01/94

Copyright Adams Publishing of Minneapolis-St. Paul Inc 1994
By Katherine Carlson

Naturopath Andrew Lucking at the Minnesota Naturopathic Medicine Clinic in Minneapolis is quoted as saying that:

> "People come to me because they've been treated like a number or a disease, not a person,". . . "A third of my patients never want to see a medical doctor again."

Carlson writes that

> Multiculturalism and world travel also play roles in the rise of alternative medicine in the Twin Cities. Our sizable Southeast Asian and American Indian populations bring dramatically different views on healing into local hospitals and clinics--from shamanism to sweat ceremonies--and discovery-minded health-care providers have listened and learned.

Zhu-San Ye, an acupuncturist in St. Paul is quoted as saying

> "Patients come to me because they can't find help in western medicine," . . . "Doctors' minds are more open now. This is a very good sign."

An example of "code switching" is seen in the comments by Miles Belgrade, a Minneapolis neurologist who states that he has patients "for whom the western model isn't working," . . . "I sometimes refer to oriental doctors, in hopes that [these patients] will better fit into that paradigm."

15. STORY ID: 0000102911WP
Breathing and Balance in a Dance of Dawn
U.S. Study Explores Ancient Chinese Self-Help Technique
WASHINGTON POST: HEALTH, 05/10/94
Copyright (c) 1994 The Washington Post Co.
By Carol Krucoff
Special toThe Washington Post

Reports on Wen-Hsien Wu, Chairman of Anesthesiology and Director of the Pain Management Center at the University of Medicine and Dentistry of New Jersey - Newark Campus, Office of Alternative Medicine Grant.

Wu was contacted for this dissertation but wrote to say he did not have anything prepared to send for inclusion.

16. STORY ID: 0000113133WP
Choosing an Acupuncturist
WASHINGTON POST: HEALTH, 08/16/94
Copyright (c) 1994 The Washington Post Co.

Short article providing consumer guidelines.

17. STORY ID: 0000113123WP
ACUPUNCTURE
Practioners Of an Ancient Art Press Their Point With The FDA
WASHINGTON POST: HEALTH, 08/16/94
Copyright (c) 1994 The Washington Post Co.
By Rick Weiss

Detailed consumer guidelines and history of acupuncture research.

Rick Weiss is the author of several articles in several publications on acupuncture. Much of the same material is repeated here.

18. STORY ID: 0000113131WP
Reporter as Pincushion: Poking Around for a Story
WASHINGTON POST: HEALTH, 08/16/94
Copyright (c) 1994 The Washington Post Co.
By Rick Weiss

Detailed description of the "teh chi" effect.

19. STORY ID: 0000426369ZF
New age healers need producers' care.
(malpractice insurance)
BEST'S REVIEW - PROPERTY-CASUALTY INSURANCE EDITION, 09/01/94
COPYRIGHT A.M. Best Company Inc. 1994
By Fran O'Connell

Detailed consumer report on certification, licensing, litigation and insurance.

20. STORY ID: 0000359408DC
Alternative care edges into medical mainstream
LOS ANGELES TIMES, 09/19/94
Copyright The Times Mirror Company; Los Angeles Times. All Rights
By Tony Perry
SAN DIEGO --

Perry writes that some assimilation is being reported:

> Dr. James S. Gordon, a clinical professor of psychiatry and family medicine at Georgetown University and an adviser to the federal government on alternative medicine, said the creation of the Sharp Institute is an important development in the movement to incorporate alternative methods into current medical practices.

Reports on the National Council Against Health Fraud's efforts to censure Deepak Chopra. States that "two devoted quackery hunters", William Jarvis, Professor of Public Health at Loma Linda University and Stephen Barrett, retired physician from Allentown, Pennsylvania and author of *The Health Robbers: A Close Look at Quackery in America*, are fighting Chopra in the press.

21. STORY ID: 0000489671MH
Government:
WILL A CUP OF COW'S WHEY KEEP THE DOCTOR AWAY?

The NIH's Office of Alternative Medicine has plenty of critics
BUSINESS WEEK, 12/12/94
Copyright 1994 McGraw-Hill, Inc.

Reports that Grace Powers Monaco, founder of the Candelighters Childhood Cancer Foundation, feels that the Office of Alternative Medicine "veered into validating quackery".

22. STORY ID: 0000126249WP
Body and Soul ; STYLE PLUS:

Taking a Hard Look at The Benefits of Herbs
WASHINGTON POST: STYLE, 12/14/94
Copyright (c) 1994 The Washington Post Co.
By Margaret Mason
Special to The Washington Post

Reports efforts by the FDA and herbal products.

23. STORY ID: 0000126847WP
A Closer Look at Herbal Remedies
Federal Officials Examine Anecdotal Evidence on Safety, Usefulness
WASHINGTON POST: HEALTH, 12/20/94
Copyright (c) 1994 The Washington Post Co.
By Rick Weiss
Washington Post Staff Writer

Report on a conference on herbal medicine sponsored by the Office of Alternative Medicine and the Food and Drug Administration

Weiss notes that in Germany herbal remedies are already fully recognized as medicines under German drug laws.

24. STORY ID: 0000448134ZF
It's time to broaden our practice.
(complementary therapies)
RN, 01/01/95
COPYRIGHT Medical Economics Publishing 1995
By Annette Swackhamer

Outlines theories of holistic therapy.

25. STORY ID: 0000387971DC
Network blends conventional, alternative care
BUSINESS JOURNAL-PORTLAND, 01/20/95
Copyright The Business Journal of Portland Inc. 1995
By Kathy Brock

Brock states that the goal of Alternare and Ethix Inc. is to offer a "mix of Eastern and Western medicine not typically offered in one clinic venture."

26. STORY ID: 0000320002WJ
Insurance:
Health Insurers Embrace Eye-of-Newt Therapy
WALL STREET JOURNAL (J) 01/30/95
Copyright (c) 1995 Dow Jones & Company, Inc.
By Barbara Carton
Staff Reporter of The Wall Street Journal

Richard Marek, Chairman of Primary Care at Lovelace Health Systems, Inc. of Albuquerque, New Mexico is quoted as saying:

> There are a number of things that we won't understand about medicine, and a long history of alternative therapies that have worked for some people, for reasons I don't understand, and nobody else understands," . . . "To ignore them, Dr. Marek adds, is foolish."

27. STORY ID: 0000137692WP
STYLE PLUS:
Body & Soul
Centering on Alternatives
WASHINGTON POST: STYLE, 04/03/95
Copyright (c) 1995 The Washington Post Co.
By Margaret Mason
Special to The Washington Post

Mason writes:

> Medical trend trackers: Last week should go down in the annals as another marker in this country's growing rapprochement between so-called "conventional" and "alternative" approaches to health care.

David M. Eisenberg is quoted as saying:

> We're now at a point where we must wrestle with the hard issues of how to contend with alternative medicine in the practice of conventional medicine and, most importantly, how to proceed with the research which will answer the questions: Is it safe? Is it effective? Will it save money, and when it works, is it working because of the pill, the herb, the pressure point, or the belief in the pill, the herb, the pressure point?

The focus of the "maiden course" is, according to Eisenberg, to provide clinicians "with the information and management skills to reliably guide and advise patients who use or seek alternative medicine."

A new Center for Alternative Medicine Research at Beth Israel Hospital was announced. Eisenberg envisions the center to be a prototype serving as "a bridge between alternative and mainstream medicine."

Eisenberg is quoted to say:

> Alternative medicine is not a passing fad and patients and their families need and deserve dependable information and sound clinical advice regarding these therapies. We need to apply to alternative medicine the same rigorous criteria and open-minded skepticism that characterize our research of more mainstream medicine.

28. Special Report: The Best of Alternative Medicine: 34 Pages of Frontier Healing
PREVENTION: AMERICA'S LEADING HEALTH MAGAZINE
December 1994

29. Medicine's Latest Miracle
HEALTH
By Rick Weiss
January-February 1995

30. We Need to Teach Doctors To Care
PARADE MAGAZINE
By Michael Ryan
July 3, 1994

Dr. C. Everett Koop, Elizabeth DeCamp McInerny Professor of Surgery at Dartmouth Medical

School, Senior Scholar at the C. Everett Koop Institute, and former Surgeon General of the United States, states:

I think the reason people in other countries are more satisfied with their health care than we are . . has to do with the availability of primary-care doctors. In Britain, 72% of physicians are primary-care doctors. Canada has 54%. Germany and France have 47% and 48%. We have 29%, and the number is falling."
<PRESSURE TO AVOID PRIMARY-CARE; SPECIALIZATION>
<CURRICULUM REFORM> Koop would change the content of the medical-school curriculum, eliminating much of the rote memorization of details- like the names and location of the muscles in the hand - and emphasize training in how to listen to patients and diagnose their problems.<end>

SECTION IX: SUMMARY

Summary

It is essential that one does not forget that surrounding the interest and research into non-Western medicine lies the overall socio-political issue of national health care reform. It is fitting that Bill Moyers's "Healing and the Mind" series which sparked so much interest into alternative medicine and non-Western medicine should be framed by his October 7, 1994 PBS special "The Great Health Care Debate" summarizing the media's coverage of the Clinton Health Care Plan. Senate Majority Leader George Mitchell declared the health care reform package officially "dead" on September 28 after a massive $100 million lobbying and advertising campaign. Lost in the so-called debate was the issue of whether or not the biomedical model needed to be modified or changed to accommodate the changing health care needs of a multi-cultural diverse population. Lost in the acrimonious attacks was the question about the fundamental theoretical issues of what a health care system should be. Kathleen Hall Jamieson of the Annenberg School of Communication did state, however, that a tremendous amount of data was collected and at some point in the future the questions will be raised again. Hopefully, by then, the paradigm change taking place within biomedicine will have reached a point where it can be clearly stated that components of various non-Western models have been integrated into a truly comprehensive biopsychosocio-cultural model.

A total of 44 hypotheses (PH1 and PH2, H1-H42) have been tested in the preliminary and content analyses studies with evidence found to support all but two claims. Passages from medical research articles along with retrospective accounts found in published interviews reveal that the claims extracted from both the Laudan et

al. study and from Garfield's work can be used to develop a model of scientific paradigm change and cross-cultural and/or international scientific communication. Findings indicate that rival sets of guiding assumptions in a medical science coexist and that debates occur all along the timeline. Debate itself has been shown to lie on a continuum ranging from simple questioning of findings through acrimonious remarks to vitriolic personal attacks.

As a paradigm is questioned, a set of guiding assumptions emerges that does not explain the successes of its predecessors but until a new paradigm is codified it is not possible to determine whether the latter set can accommodate the aspects of the earlier paradigm that helped it achieve the measure of success that it did. Thus, we see that there are "losses as well as gains in the replacement process". In the case of medicine, because there is no underlying theory supporting the biomedical model, anything that replaces it, that contains a body of theory, will, by its very nature, be more complex.

Statements expressing dissatisfaction with conventional medicine did appear as the number of articles on non-Western medicine escalated. Although there is much to justify these statements of dissatisfaction (i.e. biomedicine is impersonal, prohibitively expensive, and it dictates that the patient not be treated holistically or with much compassion) one sees that the shift in guiding assumptions is both frequently unreasoned and externally caused. The events surrounding Reston's operation can be seen to have been influenced to a great extent by Communist Chinese propaganda. Public interest in Ayurveda has been fueled to a great extent by Chopra's books and lectures promoting the Maharishi Mahesh Yogi's teachings. Demand for change in general has been brought to the public's attention by protests by AIDS activists and the

advocates of patient empowerment, such as Dr. Bernie Siegal. Medical researchers and physicians do not seem to have been guided entirely by scientifically relevant reasons to have changed their allegiance toward the study of non-Western medicine. As a result one finds that specific external factors can be identified as triggering changes in research direction and publication output.

One of the most interesting findings is that travelers' accounts and reports about foreign exchange programs serve as catalysts for change. Nothing seems to have as much impact as eye witness accounts of different methods, techniques, tools, and/or approaches to solving problems by highly respected individuals. Similarly, several examples point to the fact that physicians finally changed allegiance when they themselves had witnessed or experienced the success of a specific therapy.

There is more than enough evidence to stake the claim that proponents of one set of guiding assumptions cannot communicate fully with adherents to an opposing set of guiding assumptions. McQueen uses the term "homophily" to describe the necessary conditions for mutual understanding to occur. As Rogers and Shoemaker note, the diffusion of innovation is a particularly complex process but it is further complicated when the diffusion is being transmitted across cultural and linguistic boundaries. The elaborate theories surrounding acupuncture as a therapy derived from Chinese traditional medicine were dismissed as not worthy of attention or study. It was impossible for the early researchers to discuss testing the validity of the yin-yang and five elements model nor the validity of Taoist beliefs that the body is a microcosm of the universe because they were unfamiliar with the concepts, could not speak the language, had no background to speak of in Taoist philosophy and had not themselves practiced even the rudiments of martial arts to experience the flow of *qi*

first hand. Thus, it is clear that proponents of different sets of guiding assumptions "view the world through different conceptual spectacles".

Instead we find that the "acceptability of a set of guiding assumptions is judged largely on the basis of its ability to solve problems outside the domain of its initial success" not on the acceptance of years of case studies documenting its success. Subsequently, the number of clinical trials and journal articles about non-Western medicine did increase as evidence of successful treatments increased. Despite the fact that more and more authors expressed their dissatisfaction with biomedicine, it is still used as the primary model despite the incongruity present in the use of two competing sets of guiding assumptions used simultaneously in both medical research and in treating patients.

This need to use both simultaneously is a direct result of the fact that new sets of guiding assumptions "are suggested long before a good rationale has been provided for them" and that new sets of guiding assumptions are "suggested but ignored long before the older guiding assumptions are perceived to be in difficulty". Evidence is also found that supports the claims that new sets of guiding assumptions are "developed, accepted and exploited before apparently decisive arguments for them have been advanced" and are thought worthy of investigation largely because of factors external to science". Finally, it can be shown that authors do make references to specific external events that motivated them to undertake research outside the prevailing paradigm.

It cannot be shown, using MEDLINE data alone, that a series of journal articles discussing the effectiveness and or medicinal properties of specific non-Western treatments appear in Western journals for several years before clinical trials are

published. It is a logical assumption but it could not be tested at this time.

The only other hypothesis that cannot supported by MEDLINE data alone is the claim that journals published in countries outside of Europe and the United States publish articles on non-Western medicine for several years before such articles are published in the West. Despite the argument that China had suspended publication of medical journals during the period that has been shown to have been the period exhibiting the greatest surge in growth, one cannot dismiss the fact that there are no articles published in Korea, Taiwan, Singapore or Hong Kong found in MEDLINE for that same period. Ironically, the Westernization of these industrialized nations and their elevation of the biomedical model over their own medical traditions seems to have suppressed research by the their native scientists.

Other findings support each of the remaining claims. Clinical trials do appear before journal articles outlining the components of a comprehensive universal medical model encompassing postulates from the biomedical as well as the socio-psycho-cultural-metaphysical components of the various non-Western medical models are published. Few books are indexed indicating that at least the indexers at the National Library of Medicine do not think that the books on non-Western medicine are "fit" for scientific study". There is also evidence that there have been instances in which government or social policies have actively discouraged non-Western medicine.

The claim that paradigms shift within a period of ten years following the recognition that the prevailing paradigm is having empirical difficulty does not appear to be the case in biomedicine. This may be because during a change in guiding assumptions only a few scientists accept the new set of guiding assumptions. This in turn fosters rapid change even as resistance intensifies as change appears imminent. It

may be that the shift from biomedicine to a new medical model is still in the third stage during which a small group has made its commitment to the new assumptions and is in the process of disseminating their findings to the wider scientific community; but there has yet to be a conversion of a majority of biomedically trained health care practitioners and researchers. This can be seen, in part, by the fact that the core group of authors with multiple publications in acupuncture do not account for the largest percentage of total publications.

It can be shown that appraisal of a theory "is sometimes favorable even when scientists do not fully believe the theory, specifically when the theory shows a high rate of solving problems" and that in the case of medicine, appraisal of a theory depends on results from clinical trials because medical researchers will only accept findings that give them a clear choice between contending theories. In contrast to the internal workings of biomedicine, it can be shown that the public is in the early stages of being informed about a scientific paradigm shift as results are being reported in books targeted toward the general public and specialists that develop the subject from fundamentals. Increasing numbers of television programs, magazine articles and books about non-Western medicine are being directed toward educating the consumer about his/her choices. Early work on non-Western medicine has been shown to be descriptive and it does appear to have progressed through a series of stages.

Abstracts and articles in the early stages did contain statements explaining the differences between non-Western and Western models and they did disappear over time. It is not clear whether the primary unit of publication is the journal article or not. Clinical trials may always appear once a topic is judged to have merit as each aspect of the new paradigm needs to be studied. However, it has been shown that the

majority of articles before a shift are historical reviews and review articles if one agrees that a shift started to appear when clinical trials appeared.

Non-Western medicine is, of course, not a science. It cannot even really be labeled a discipline. The term here is used to denote a body of theory that is diametrically opposed to the biomedical model. If the theories found in the many non-Western medical systems is seen as merging to form a new paradigm then, one does find support for the claim that "in a fully developed science research results are reported to scientific societies, published in specialized journals, and codified in textbooks". In addition, books about non-Western medicine and the many popularizations and philosophical discussions presented to the public do not accurately report how changes in guiding assumptions came about. Instead it can be shown that they present only some of the relevant evidence as if it were all the evidence.

In contrast to the support that in a developed field findings are reported to the scientific community, it can be shown that because a new paradigm has not yet emerged, advocates of biomedicine are still criticizing their rivals, not by pointing to failed predictions, but by attacking their general plausibility and by attacking their professionalism -- an indicator of an undeveloped field. Statements containing words or phrases labeling aspects of non-Western medicine as nonsense and unscientific appear alongside allegations that the proponents of non-Western medicine are promoting quackery and that the practitioners themselves are quacks and their work is unworthy of scientific recognition.

The dilemma still stands, however, as to whether or not we are seeing a transition to a developed science that is accompanied by the formation of specialized journals, societies and academic curricula or not because biomedicine is still dominant.

If change does continue, nonetheless, one will see that the new paradigm will stand in direct contrast to the biomedical model and will naturally be much more complex.

One last piece of supporting evidence that needs comment concerns the fact that on May 22-25, 1995 the First Annual International Congress on Alternative & Complementary Medicine will be held in Arlington, Virginia. The conference, sponsored by Mary Ann Liebert, Inc., publisher of *The Journal of Alternative and Complementary Medicine: Research on Paradigm, Practice and Policy* and *Alternative & Complementary Therapies*, is being promoted as "A global forum to bridge the gap between alternative and mainstream medicine . . . The new paradigm for health care reform" which is in so many words is the very subject of this dissertation. It seems that there is, without a doubt, a serious effort toward the integration of some of the tenets of non-Western medicine into the biomedical model. Nevertheless, the main conclusion drawn from this study is that the biomedical model itself needs to be replaced by a new paradigm not just modified to be able to accommodate rival sets of assumptions.

Proposed Future Research

The wealth of data obtained and processed for this study will be used in the future to develop a model of scholarly communication and to test additional hypotheses. Data extracted from other data banks will be used to answer additional research questions. One possibility is in the area of bibliometric and demographic research. For example, if one tracks immigration and foreign exchange student figures with the growth of the literature it might be possible to determine whether the flow of communication between East and West is also influenced by cross-cultural educational exchanges.

Commercial research is another avenue. Several possibilities exist such as 1) tracking the instances of virulent strains of bacteria or drug-resistant parasites, AIDS and mutant forms of TB and matching with the search for drugs in non-Western pharmacopeia; 2) matching Chinese, Japanese, Latin, Ayurvedic, Arabic and English names for each plant or crude drug; and 3) tracking the study of each substance by each country's researchers.

Another area is mass media research. It might be possible to explore the parallel growth in the popular literature along with an increase in the number of television programs and news segments. (e.g. *Food: Your Miracle Medicine* by Jean Carper, series by Bill Moyers, TBS special 6-hour presentation on alternative medicine hosted by Jane Seymour aired week of October 24, 1993 and "Spirits of the Peruvian Rainforest" aired on The Discovery Channel the same week)

Finally, one can expand this study by randomly selecting authors from the data set to participate in a survey of their research interests, current and past institutional affiliations, collaborations and command of languages. Another avenue of research is to add qualitative data by conducting a series of interviews with authors selected from survey responses designed to identify their perceptions of and documentation of the paradigm change and the processes of international scholarly communication. Considering the depth and scope of this topic there should be no difficulty in designing and testing additional models of scholarly communication as they pertain to the study of non-Western medicine in the hopes of developing a holistic model of scholarly communication across all disciplines.

Invisible Colleges

One area that needs special attention is the identification of invisible colleges.

Several hypotheses need to be tested, although it must be pointed out that there are errors in the MEDLINE data which may affect the mapping of author collaborations without checking the spellings and institutional affiliations printed in the original publications. Crane (1972), Zuckerman (1977) and others have presented findings that indicate that there are core groups of authors who are linked to one another through the mentoring process, collaborations formed while working at the same institution, and collaborations formed through professional societies and electronic mail. Of interest is the identification of international collaboration and/or channels of transmission from East to West and from West to East across both cultural and linguistic barriers. Medical research is a special field of interest because like some areas of science the greatest measure of success of performance output is that of finding a marketable cure. The motivation for collaborating across cultures or for not collaborating and choosing to compete nationally is extremely great. The identification of flows of communication between groups is, therefore, of major interest.

Recent advances in microcomputer software programs have made it possible to analyze large text files in order to generate *ad hoc* reports. Taking advantage of these advances researchers can now ask several questions. By converting MEDLINE records into a series of linked tables, instant reports can be generated that present the names of authors in alphabetical order listing their institutional affiliations and the number indicating the placement of each author's name on each article. Earlier research designed to uncover invisible colleges focused on lists of authors matching individuals with their collaborators and their institutional affiliations. Most of this research was limited to studies of samples from fixed time periods or from narrow

specialties because of the restraints made by the computers and computer programs that were available. The following research questions derived from the work of Garfield, Merton, Crane, Zuckerman, Cole and Cole, and others will be used to generate a series of hypotheses can now be tested:

Future Research Question 1 (FRQ 1): Who are the primary authors publishing articles indexed under each subject heading?

FRQ 2: Are there authors who publish in more than one subject area?

FRQ 3: Who belongs to the core group of authors who publish the majority of articles?

FRQ 4: Of those who list their institutional affiliation, is there a core group publishing at any one institution?

FRQ 5: Who are the secondary authors?

FRQ 6: Who are the primary authors who also publish as secondary or contributing authors?

FRQ 7: Are the secondary authors (or authors whose names appear in the third through tenth positions) who have been identified with an institution (as primary authors) publishing with primary authors at the same institution?

Garfield (1983a) states that in a study of the 1,000 most-cited authors of journal articles from 1965 to 1978, most eminent scientists "received nearly twice as many citations as secondary authors than as primary ones. They also published more cited papers as secondary authors than as primary ones" (p. 623). This pattern should appear in studies of non-Western medicine as well. In addition, studies of the Matthew Effect indicate that eminent scientists are linked to one another through both the mentor relationship and research collaboration. Thus, one could test the following:

Future Hypotheses 1 (H1): First author institutional affiliations are linked with the institutional affiliation of other first authors when the former is the secondary or contributing author. e.g. S. Liu at the Beijing Medical College publishes several articles as first author then publishes as a secondary or contributing author with T. Zhang from the Beijing Medical College.

FH2: Authors collaborate more often with others who share each others' predominate language and culture than with foreign authors.

FH3: Authors collaborate across cultural and linguistic barriers when the material in question requires native language expertise.

FH4: The majority of researchers in the early stages of a science with a primary literature in a given language will be native speakers of that language.

FH5: The majority of researchers in the early stages of a science that has a connection to a cultural or historical tradition unique to a specific region will be natives from that region.

FH6: Authors collaborate with other authors who speak the same languages, work within the same institution or within the same geographic area and who typically publish within the same subject speciality.

FH7: Scientific fields are "defined by communities of researchers, not by guiding assumptions" (Laudan et al., pp. 178-179)

FH8: Communities of researchers "grow larger in numbers of distinct communities with time" (ibid.)

FH9: The number of multiple authorships increases as well as the number of authors collaborating with one another.

FH10: Primary authors whose works are the amongst the first to appear on a topic

will appear as collaborators with others over time on the same topic.

Although Arthur M. Diamond, Jr. (1988) concluded from his logit regression analysis of biological age and professional age of chemists' acceptance of polywater were not a determining factor, Kuhn's quote from Max Planck (commonly referred to as the Planck principle) is perceived to be a factor by the participants within the field of alternative medicine as demonstrated by marked passages in Table 15. Using Diamond's study as a model, one hypothesis that could be tested then is

FH11: "New assumptions are introduced, and initially accepted, chiefly by scientists who are either young or new to the field" (Laudan et al., p. 186).

One claim that cannot be tested using bibliometrics or content analysis of research abstracts is the claim made by Kuhn that "Scientists who adopt a set of guiding assumptions are sometimes influenced by their nonscientific beliefs . . . However, not all reasons for preferring one set of assumptions to another are non-scientific" (p. 195). Some support for this claim can be found in the extracts in Table 15; however, in order to test this claim one should conduct a series of interviews with core authors identified from the bibliometric analysis of the research literature.

Additional testing of Hypothesis 41 is also needed. Bibliometric analysis of the types of journals their rankings and research society and institutional affiliations can be used to support hypotheses about the differences between organs of communication. For example, one issue that is of major importance to information science and library science is whether or not commercial publishers dominate the dissemination of information and if so, what are the costs? One can see that the survival of *Acupuncture, Electrotherapeutics Research: The International Journal* was dependent upon the whims of a publishing house. What does this mean for the future of

scientific communication?

Patterns of Growth

A final area of study is the bibliometric analysis of growth patterns. One such hypothesis is:

FH12: Using Price's (1963) models of logistic growth (escalation, loss of definition, divergent oscillation, convergent oscillation), it is predicted that the number of articles indexed in MEDLINE under the subject headings for non-Western medicine from 1966 to 1993 will increase at a steady rate similar to a pattern of escalation, followed by a period of saturation as evident in a logistic curve.

In 1970 *Index Medicus* became available on-line as MEDLINE. Since then an expanded version of MEDLINE has become available that includes bibliographic records from 1966 to the present. These records, unlike the printed references, provide several medical subject headings which can be used to identify articles classified according to narrow subject specialties and topics. As drug research is often a field unto itself, in that many studies of substances are designed to discover chemical properties known to have medicinal benefits in specific instances, much of this research is less dependent upon philosophical and theoretical issues embedded in the medical model. Being less dependent upon the overall paradigm, pharmacologists are presumed to be free to test all substances in the hopes of finding new medicines, therefore,

FH13: Extracting only those articles on non-Western pharmacological substances, it is predicted that the number of articles will begin to increase before other research and continue to increase at a faster rate.

Garfield has demonstrated that the bulk of research appears in general interest

journals and very narrowly defined special interest journals. Articles that appear in core journals, however, have the widest readership. New research must gather recognition before appearing in core journals, thus:

FH14: Articles in Western journals first appear in general interest medical journals and gradually appear in core journals.

FH15: Highly cited medical journals publish different types of articles on non-Western medicine than rank and file journals.

FH16: Articles on non-Western medicine will not appear at first in the highly cited prestigious journals.

A series of research questions can also be raised:

FRQ 8: Are there patterns of increase or decrease in the number of articles on any given disease, plant, drug or medical condition over time?

FRQ 9: Are there changes over time in the study of plants, crude drugs, or medicinal substances?

FRQ 10: Are there patterns of study of specific crude drugs used to treat specific diseases?

To conclude, the study of paradigm change in biomedicine and the study of non-Western medicine in an of itself has been shown to be such a rich area of research that one cannot possibly formulate all of the research questions and hypotheses that needed to be addressed. The author is grateful to have discovered an area that is of interest to almost everyone and one that contains more than enough challenges to satisfy a lifetime of research and study.

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Notes

1. The most obvious barrier to the transmission of ideas is language. In many instances the language of the text or the markings on the object can not be interpreted by the individuals who have access to them today. Such materials may be in museums, library archives or private collections. Until the day when most of these materials are cataloged and entered into comprehensive international online catalogs, it is impossible to determine just what is available for study. Nor is it possible to determine what percentage of materials is written in translatable languages and what percent is written in yet to be deciphered languages.

2. Dr. Jacobs's resigned on August 8, 1994. According to Rick Weiss, a Washington Post staff writer, in a Dow Jones version (STORY ID: 0000111699WP) of his article "Alternative Medicine Chief Quits --- NIH's Jacobs Was Vexed by Political Pressures" in the August 2, 1994 issue of the *Washington Post*, Jacobs announced he was leaving the high-profile post for a less contentious position in health care or academia. Weiss states that Jacobs said "he was frustrated by pressure from Congress and some proponents of unproved therapies clamoring for attention to their favorite alternative therapies. He said the office was being pushed to make decisions on political rather than scientific grounds". As background it is interesting to note that Weiss writes that

> Jacobs was widely praised as the perfect choice for the job when he was appointed by then director of the NIH Bernadine Healy. He is a medical doctor with an MBA who understands the importance of scientific rigor. But he is also a Native American who grew up surrounded by traditional healing practices and who served for three years as a pediatrician on a Navajo reservation in New Mexico. His openmindedness to alternative medical approaches in combination with his training in down-to-earth scientific methodology promised an ability to find a middle ground between conservative MDs on the one side and alternative medicine extremists on the other.
>
> But from the start, both Jacobs and the office were burdened by small budgets and big politics. The relatively minuscule starting budget of $2 million (which Congress may raise to $6 million in the coming year) meant the office was able to provide only about $30,000 to each of its first grant awardees -- a small fraction of the average NIH grant and barely enough money to perform a worthwhile clinical trial. Jacobs often joked despairingly that he was expected to run the office on "a homeopathic budget," a reference to an alternative medical technique that uses tiny doses of drugs.
>
> Meanwhile, Jacobs was swamped by tales of miraculous recoveries from countless individuals who felt they had personally benefited from one alternative or another -- many of whom found a friend in Sen. Tom Harkin (D-Iowa), the guiding force behind the creation of the alternative medicine office. Harkin, who has said he got relief from his allergies by eating morsels of bee pollen, has frequently been at odds with Jacobs.
>
> In particular Harkin has argued that the office should sponsor more field studies, in which the NIH would send observers to alternative practitioners to review their reports of efficacy. Jacobs has preferred focusing on controlled clinical studies, in

which alternative approaches are compared directly to other methods. And he has bristled openly about interference from Harkin and others who, he said, give too much credence to anecdotal reports.

3. Gans 1979 points out that journalists often treat themselves as sources for news stories documenting their interests in their own health care and their own families' experiences (pp. 127-128).

4. Fulder defines homeopathy as the method that "uses minute doses of plants that mimic the symptoms of the disease" while herbalism "utilizes large doses of other plants to undermine the symptoms" (p. 17). It is important to make this distinction as there have been significant differences in the way European and American physicians have viewed homeopathy in the twentieth-century.

5. Engel quotes H.R. Holman's 1976 article in *Hospital Practice* Volume as stating

> "the Medical establishment is not primarily engaged in the disinterested pursuit of knowledge and the translation of that knowledge into medical practice; rather in significant part it is engaged in special interest advocacy, pursuing and preserving social power" (p. 11).

Engel concludes that "nothing will change unless or until those who control resources have the wisdom to venture off the beaten path of exclusive reliance on biomedicine as the only approach to health care" (1977, p. 135).

These two passages exemplify the types of political issues embedded in organizational communication currently being studied by such researchers as Stanley Deetz, David Knights and Hugh Willmott. It is outside the scope of this dissertation to address the wider issues surrounding the current health care debate; however, it should be stressed that the paradigm shift toward integrating components of non-Western medicine into what might be what Engel calls a biopsychosocial model is intricately connected to Clinton's political agenda, the political agendas of numerous players including the American Medical Association, American Physicians?. . . , the health-care insurance industry, lobbyists, the health maintenance organization industry, malpractice lawyers, health-care database providers, the hospital industry, health-care workers organizations, as well as the economic agendas of global players (see for example the article on Dr. Jacobs's resignation from the Office of Alternative Medicine, Washington Post August 8, 1994 in Appendix 3). There are countless personalities involved each vying for communicative dominance. The debate holds the public's attention at the moment but the rise and fall of the biomedical model is one that can be studied in its context over the past two to three centuries. Such a study needs to utilize an integrated, highly sophisticated theoretical model - one that has yet to be developed.

6. *qi* (chi) can best be described as electro-magnetic energy that feels like a sensation of heat often accompanied by a sensation of tingling almost identical to the feeling one receives when hooked up to a electro-stimulation machine (e.g. TENS

unit). The sensation of heat can be classified along a continuum from mild warmth all the way up to what some claim feels identical to the sensation one receives when stepping too soon into a very, very hot bathtub. Some have used the term "pins and needles" but this is a different sensation is actually caused by blockages of blood to the affected area. The tingling is the same as that felt by music lovers and musicians when certain passages of music are heard or played.

In some cases students studying *qigong* have reported that they can feel "fire" emanating from their teachers. Kung Fu and *taijiquan* pushing techniques focus *qi* as a force and there are several articles documenting the "feats" of the Shaolin monks, Kung Fu masters and *qigong* masters.

Although the sensationalized accounts are fascinating and feats of Kung Fu and *qigong* masters are certainly amazing to see in person, the concept of *qi* is essential to the understanding of the Chinese medical model as all disease and illness is caused by blockages or improper circulation of *qi*. This applies to *qigong* masters as well for even they can only fall ill at the right moment in time when they are not monitoring their flow of *qi*.

7. There are some sources and traditions that maintain that rocks, minerals and some man-made objects contain a kind of *qi* (the word *qi* may or may not be used) that is similar to the concept of "mana" found in Pacific Islander belief systems and in many shamanistic traditions as well. This aspect falls more generally under the umbrella of paranormal studies and is rarely, if ever, given mention by authors trying to adhere to the norms of science. Although relegated as separate from the main body of thought, belief in an energy that permeates everything in the universe does not conflict with the latest findings about molecules and atoms flowing in and out of all matter and as such appears in a large body of "New Age" literature and popular fiction.

8. Please note these are the terms used by the Chinese texts and their translators. Although the modern reader objects to the use of such terms, it is most likely that these are the ones that most closely approximate the meaning within the Chinese language at the time the ancient texts were written. The continued use of such terms has also probably been retained over time rather than risk losing the authenticity and authority of the writers over time.

9. The 1984 15th edition of the Encyclopaedia Micropaedia volume 1 states simply that "In 1971, two U.S. scientists observed the surgical removal of an ovarian cyst under acupuncture anesthesia in Peking. They reported that the needles were inserted in the patient's wrists and that she remained totally conscious with no evidence of discomfort" (p. 72). The New York Times Index, however, along with the microfilm of the actual newspapers, provide the additional information. Nonetheless, it is important to point out the significance of this event in that it is incorporated into a major encyclopedia's entry on the topic.

10. An interesting illustration is given by Eisenberg (1985) in his description of the models of tongues that each student had to memorize taking note of the color and covering of each.

11. Referring to Transcendental Mediation, Skolnick (1991) writes that

"An investigation of the movement's marketing practices reveals what appears to be a widespread pattern of misinformation, deception, and manipulation of lay and scientific news media. This campaign appears to be aimed at earning at least the look of scientific respectability for the TM movement, as well as at making profits from sales of the many products and services that carry the Maharishi's name.

The TM movement frequently boasts of the `sophistication and effectiveness' of its publicity program . . . (p. 1744).

Skolnick goes on to say the movement has every reason to brag considering that in June 1991 THE JOURNAL published an article in which "the Maharishi's remedies were described as if they were scientifically acceptable" and a conference entitled "Medical Conference on Maharishi Ayur-Veda: Non-Pharmacological Approaches to Prevention and Treatment of Chronic Diseases" was held in San Diego, California under the approval of the American College of Preventive Medicine. The 13 hour conference received the American Medical Association's Physician's Recognition Award category I Continuing Medical Education (CME) credit (p. 1745).

It is of particular interest to this study to note that Chopra's popularity and financial success is connected to the overall shift in public attitudes toward alternative medicine and non-Western medicine in general. An entire dissertation could be written on the impact of the TM movement on the paradigm change in Western medicine. Considering how many people asked the author about Chopra's works while conducting this study, inclusion of his work along with a disclaimer and information documenting Chopra's finances is necessary.

12. Technically, an analysis of bibliometric growth should entail a mathematical test for exponential growth and a test for logistic growth of cumulative data. However, this is not a formal bibliometric study per se but a sociological one that simply uses bibliometrics as a tool for identifying trends in the treatment of very specific subject headings.

13. Laudan et al. also summarize Kuhn as making a similar claim that "The primary unit of publication in periods of consensus is a brief research report in which the guiding assumptions are taken for granted" (p. 183). As these two appear to be almost identical and the latter necessitates defining what is meant by "brief", and requires a much closer examination of the full-text of the reports than the scope of this dissertation permits, claim (20) will be tested instead.

14. Readers should note that this reference is problematic. De Mey lists the date to the reprint of James' work in his introduction to the 1992 edition as being the "1979 edition" of a New American Library publication, however, in the bibliography at the end he lists it as 1974. Kilmer library owns a 1955 copy of a Meridian imprint which matches the description of an RLIN record for a 1974 New American Library edition - Meridian being an alternate trademark of New American Library. The William James Preface which appears in the book does not discuss the stages of acceptance of ideas; however, one of the essays discusses the creation of new ideas.

15. The external factors presented here are selected social, political and economic events which have either aided or prevented cross-cultural scientific exchange and scientific communication. Wars, for instance, prevent travel to some areas for most scientists wishing to conduct research. Closed borders, lack of diplomatic relations and fear of military coup d'etats all impede the kinds of open scientific communication necessary for advancing a field. Similarly, joint ventures, government sponsored economic and social exchange, constantly improving telecommunications and interlibrary loan programs, elimination of bureaucratic restrictions on access to archival materials all aid in the exchange of scientific information.

Internal factors in this model refer not to the factors referred to by Fuchs such as organizational structure but to events within the field of medicine that have range from the discovery of new viruses, bacterial infections and parasites to the discovery of new technologies, drugs and treatments. Funding falls into both categories. Funding may be viewed as an external factor if the monies are from a government grant or an on-going government program. Funding may be internal if one focuses on how monies are allocated within the pharmaceutical industry for drug research, within hospitals for research and patient care as well as any number of other possibilities. The point to stress, however, is that the distinction being made is one is derived from a Western sociology of science.

16. On October 1, 1994 Rutgers University succeeded in mounting the PaperChase online version of MEDLINE on its Info System. PaperChase is the only system that lets the user search MEDLINE, Health Planning and Administration (HEALTH), CANCERLIT, and AIDSLINE at the exact same time, automatically eliminating duplicates. On October 8 PaperChase contained 8,521,171 references -- all references found in the National Library of Medicine and the National Cancer Institute*. The welcome screen indicated the following:

....

You are searching all four databases simultaneously.

Database	Indexing Began	Updated	Current Through
MEDLINE	1966	weekly	December 1994 Update, Part 1
HEALTH	1975	monthly	October 1994 Update
AIDSLINE	1980	monthly	October 1994 Update
*CANCERLIT	1980	monthly	September 1994

....

A search using the truncated keyword bibliometric# for both title and ME Subject Heading conducted on October 7 yielded a total of 97 references for the time period 1966-1994. Except for a few studies of the impact of specific journals on Chinese Traditional Medicine, medical information in Arab countries, Croatian medical science and Spanish olaryngology, no bibliometric studies of the field as a whole were located.

On October 8 a search of the entire database for articles coded as pertaining to both "Models, Theoretical/" and "Philosophy, Medical/" yielded a total of 73 references none of which focused on the grand theory of medicine known as the biomedical model. Examples of pertinent articles are presented in Appendix 4 coded for passages indicating integration of components of non-Western models.

17. There were 5,330 unique articles on acupuncture downloaded from the CD-Plus MEDLINE workstation for the period 1966 through May 1994. 8 articles were published in 1994, 1 in 1964 and 9 in 1965. Print outs of the entire data set sorted by year and MEDLINE accession number reveal that a significant number of articles were received by MEDLINE 1-4 years after publication. A few were received after 10-15 years. Thus, any attempt at capturing an entire year's set of publications should be made at least one year after the last date of publication. The totals, therefore, for 1993 may be incomplete.

18. The Matthew Effect is a term coined by Robert K. Merton to describe the phenomenon that the more recognition, prestige and awards a scholar earns the more he receives and vice versa.

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